DOCUMENT RESUME

ED 083 771 EC 060 325

AUTHOR	Barraga, Natalie; And Others
TITLE	Aids for Teaching Basic Concepts of Sensory Development.
INSTITUTION	American Printing House for the Blind, Louisville, Ky. Instructional Materials Reference Center.
SPONS AGENCY	Bureau of Education for the Handicapped (DHEW/OE), Washington, D.C.
BUREAU NO	H2289B
PUB DATE	73
GRANT	OEG-2-6-062289-1582
NOTE	157p.
EDRS PRICE	MF-$0.65 HC-$6.58
DESCRIPTORS	Behavioral Objectives; Childhood; Cognitive Development; Concept Formation; Early Childhood; *Exceptional Child Education; *Instructional Materials; Number Concepts; Readiness (Mental); *Sensory Training; *Sequential Learning; Skill Development; *Visually Handicapped

ABSTRACT

Instructions for using and constructing approximately 58 instructional materials to aid young visually handicapped children in developing basic sensory concepts are presented. The materials are said to foster important ideas in variously aged children who have difficulty using their hands or understanding numerical concepts. Use of the materials is advised after students are exposed to different media indicating what hands can do and when students are prepared for readiness work. The materials are said to develop the following hand skills: handling, placing, putting together, arranging, fitting, pushing, pulling, assembling, and maneuvering. Directions are given for using the teaching aids, teaching according to main concept in sequence, obtaining commercial materials, and constructing the materials. Each material is presented in terms of description, purpose, behavioral objective, procedures, use, other materials needed, and directions for construction. Presentation is sequential, in order of large and simple to small and complex for attainment of the following concepts (number of materials for each concept is in parenthesis): form (11), position (nine), size comparisons (11), texture (five), similar and different shapes (nine), number (four), and enrichment of basic concepts (nine). Usually provided is a diagram and a photograph to illustrate materials such as the frame-a-circle, position peg board, big and little triangles board, texture matching blocks, sound matching board, and object concept plaques. (MC)

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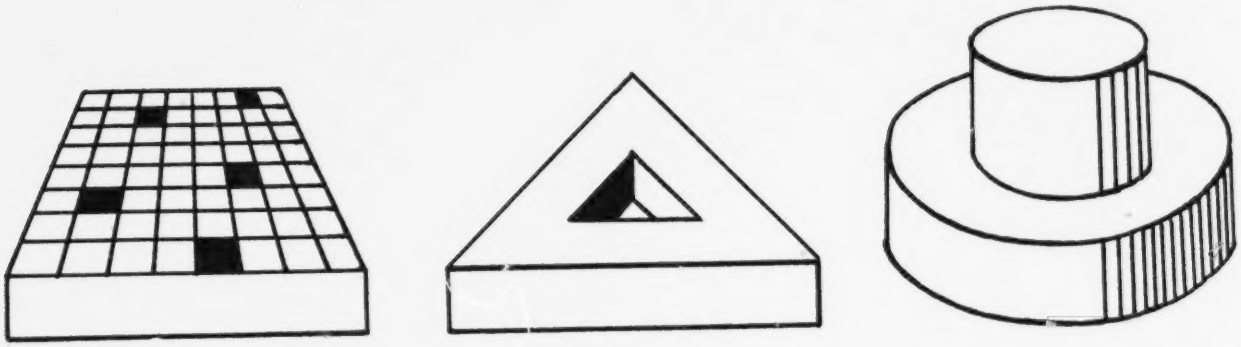
AIDS FOR TEACHING

Basic Concepts



OF SENSORY DEVELOPMENT

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by Natalie Barraga
Barbara Dorward
Peggy Ford

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AIDS FOR TEACHING
Basic Concepts
OF SENSORY DEVELOPMENT

By
NATALIE BARRAGA
BARBARA DORWARD
PEGGY FORD

Instructional Materials Reference Center
AMERICAN PRINTING HOUSE FOR THE BLIND
1839 Frankfort Avenue
Louisville, Kentucky 40206

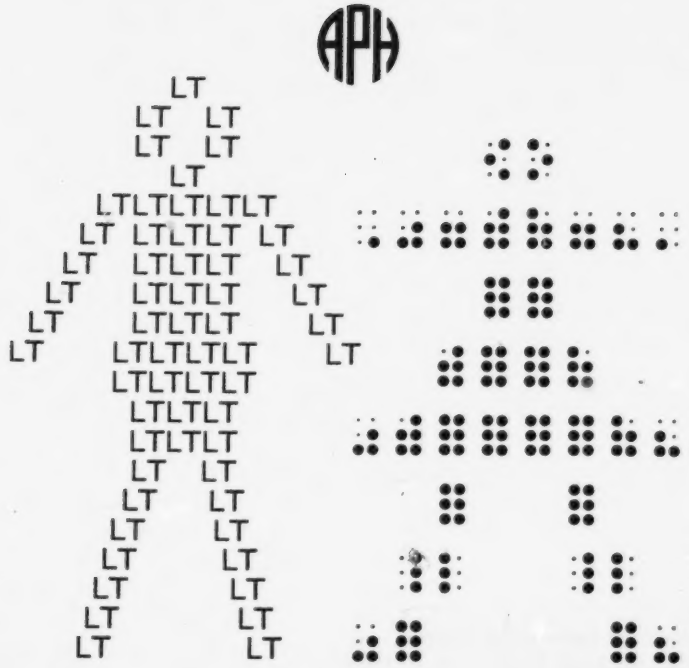
1973

Published and distributed by:

INSTRUCTIONAL MATERIALS REFERENCE CENTER FOR VISUALLY HANDICAPPED CHILDREN
AMERICAN PRINTING HOUSE FOR THE BLIND
Finis E. Davis, Vice President & General Manager
Carl W. Lappin, IMRC Director

In Cooperation With the
Bureau of Education for the Handicapped
U. S. Office of Education

Funded by: Grand #OEG-2-6-062289-1582
Project H2289B
Transaction 730E7163
Public Law 88-164



This manual is dedicated in
appreciation to the four men who
willingly donated their time and
talents to construct these teaching aids:

David A. Ahlstrand

David L. Dorward

James H. McGinnis

Edward Rex Neely

ACKNOWLEDGEMENTS

The authors wish to express their gratitude to the Maryland School for the Blind and the Utah School for the Blind for using and evaluating these teaching aids. The entire series was developed and used by teachers of multi-handicapped visually impaired children at the Maryland School over a period of six years. Almost half of the teaching aids have been used in the Utah School for three years. Without these practical laboratories for testing the materials, the revisions and improvements could not have been made and new ideas for the teaching aids would not have been generated.

A special word of appreciation goes to the following people who gave so much of their time and themselves in the final preparation of this manual:

Christina Baugh

Ina W. Kurzhals

Jean H. Neely

FOREWORD

For a number of years a phase of the educational program for young visually impaired children at the Utah School for the Blind has been the development of knowledgable ways to use hands through the handling of a variety of materials meaningfully. In the book **Piaget's Theory of Cognitive Development** the following statement is made which has untold worth for all teachers:

"A child cannot move intellectually from the preoperational stage to the period of formal operations without passing through the period of concrete operations."

With no intake of information through vision, one of the most valuable ways to help a blind child learn is through concrete operations of the hands.

For the past three years teachers at the Utah School for the Blind have used the teaching aids designed by Barbara Dorward and Peggy Ford. Much has been learned through experimenting in a variety of ways with the materials.

At first the objects were presented to young children. It was soon learned that so many important ideas could be taught through the use of these materials that older blind children who had difficulty using their hands and understanding realistic numerical concepts were helped to overcome their problems through working specifically with these aids. It was also found that children who had lost interest were again motivated to learn through handling these materials. The hyper-active children became relaxed and their attention span increased when they were helped to handle the Dorward-Ford teaching aids in meaningful ways.

Careful thought must be given in the construction of items for visually impaired children. It is important that objects made be durable and able to stand much handling and use. It is also of value that materials promote some decision making and vocabulary development. It is of interest to children to handle objects made of different textures. Also the material used should develop ideas beyond mere manipulation. The Dorward-Ford aids meet all the above qualifications. Alsc these objects have been designed in sequence. To be of real value to the child, materials must be introduced from the large, simple to small, more complex. The child must accomplish something in working with materials before the lesson comes to a close. One hand skill is developed before another is introduced. The following hand skills can be developed with these aids: handling and placing; putting together; arranging; fitting; pushing and pulling; assembling; and maneuvering.

The faculty members who have had access to the Dorward-Ford aids have been unusually grateful. These materials have proven of untold worth in enhancing the educational program for young visually impaired and for older children who have a variety of handicapping conditions.

Ina W. Kurzhals
Curriculum Director
Utah School for the Blind

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USING THE TEACHING AIDS

These Teaching Aids for basic concepts of sensory development are not introduced until the child is ready for readiness work. He should have been exposed already to many varied media through which he has become aware of what his hands can do. Examples of hand skills he should have experienced are holding, handling, dropping, reaching, finding, picking up, putting in, taking out, pulling, pushing, putting on, taking off, putting together, taking apart, etc.

When the teaching aids are introduced, they are re-enforced at each step with many examples from the child's immediate environment. As each teaching aid is presented in the manual, specific suggestions are made for expanding the concept into the child's daily world and making it meaningful to him.

The order in which the teaching aids are listed in the manual is the suggested sequential order of presentation. The sequence has a basic framework from simple to complex, but can be varied according to each individual child's needs and understanding. For that reason, no specific step by step lesson plans have been included. Instead, suggestions have been made for the use of each aid, the skills which the child should have before attempting it, and the ultimate behavioral objective desired.

Although each aid was designed for a specific purpose, most of them can be used in a variety of ways. Having a variety of materials for each concept gives the teacher a choice of several avenues through which to reach the child and broaden his educational experience.

A supplementary list is included, grouping each aid according to the main concepts taught. An aid may be presented for an elementary concept and later be introduced to re-enforce another concept or go into more depth. In many cases, the teaching aid described will trigger an idea for the teacher to create materials of her own.

The teaching of several basic concepts may run parallel. For example, beginning number concepts may be introduced when the child indicates a readiness for this and may be correlated with his work on sequencing, alike and different, size, etc.

Teaching Aids According to Main Concept Taught in Order of Increasing Difficulty

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SIMILAR COMMERCIAL MATERIALS

The Hands Position Puzzle (page 13) is available from the American Printing House for the Blind. Although the other teaching aids are not on the market, there are similar commercial materials which could easily be modified and adapted for use with visually handicapped children. Where a similar commercial teaching aid is known to be available, this will be indicated in the write up of each teaching aid. The primary difference between these and the teaching aids in this manual are size, simplicity and durability. They are purposely included in this manual to show their position in the sequence of concept development. Also they can be made more economically than they can be purchased if the teacher can locate a source for constructing them.

The primary type of materials available commercially are those dealing with form and size. Form boards come in **many** varieties. Frequently, the blocks (and bases) are textured rubber or have knob handles; the number of blocks varies from four to twelve. The important factor would seem to be that the child is familiar with all of the shapes before he is confronted with them in a puzzle in which he must discriminate among similar blocks.

Teaching aids for size are available in crepe foam rubber and in wood. Usually, three or four sizes of a shape are given and frequently another factor, such as color matching, is incorporated.

The majority of commercial puzzles to teach the concept of difference and likeness rely on position and size as the differentiating characteristic; a few use the difference of shape. However, most of the shapes are silhouettes of objects which would probably not have meaning to most visually handicapped children. That was the rationale for using primarily basic shapes with which the child was familiar in the teaching aids in this manual.

Commercial textured rubber discs are available for matching textures. However, a greater variety of textures can be used when they are mounted on blocks. Textured beads are available with various textures cut into the wood itself.

Sound matching cylinders are available for auditory discrimination. This teaching aid was included in the manual not as an original idea, but as a suggested way to make this material with greater variety and economy, and as an important step in the learning sequence.

Peg boards are available commercially in a number of varieties. Those with large enough pegs could be adapted with textures. Regular pegboards could be used for some of the number concepts and counting.

GENERAL CONSTRUCTION DIRECTIONS

The majority of the teaching aids have bases into which pegs or blocks are fitted. This is not vital to the understanding of the concept involved **unless** the primary behavioral objective is manipulation. If the child's visual handicap and/or motor involvement make this unfeasible, the blocks alone can be utilized. Having a base, however, gives the child an activity with the blocks (something to do with them) and provides an opportunity for his following specific directions. In addition, having base-trays is a way to have materials sorted and ready for quick selection by the teacher.

The bases for the majority of the teaching aids are constructed from two pieces of plywood; the upper one is used for cut-outs or peg holes and the lower one forms the bottom of the base. Plywood of 3/8" or 1/4" thickness is used for the cut-outs: 3/4" plywood is used for pegboards in order to have the holes deep enough. The cut-outs are 1/16" to 1/8" larger than the blocks; peg holes are 1/16" larger than the dowel pegs. A liquid glue is strong enough to secure the sections of the base together. Careful sanding of the boards and blocks is very important so that the visually handicapped child will find pleasure in the smoothness and will not encounter rough places or sharp edges when exploring and examining the materials.

Few of the aids are painted; when paint is used it is for the purpose of emphasizing a particular concept which is being stressed. Most of the boards and blocks are finished with two coats of clear varnish. Pegs are finished with a wax stain unless they are painted.

The Authors

TEXTURED SPOOL BEADS

Description:

Textured materials are glued to wooden spools to make beads.

Purpose:

The variety of textures encourages exploration and manipulation more than plain wooden beads.

Behavioral Objective:

The child will willingly handle and explore the beads of different textures.

Procedures and Use:

These beads are used in the development of early hand manipulation skills. With them, activities of holding, handling, dropping, reaching, finding, picking up, putting on, and taking off can be practiced. The textures make such explorations more interesting.

The use of the beads moves through manipulating them as objects to exploring the different textures on each. The beads are strung randomly at first. The teacher can point out some of the more distinctive textures for the child to identify. Finally the child may string the beads according to directions, matching textures and surfaces.

Other Materials:

Beads with textured wooden surfaces are available.

Textured Spool Beads

Step 1: Use wooden spools 1⅛" to 1¾" in height.

Step 2: Sew or glue textured fabrics and materials around the straight portion of the spool.

Suggested materials:

- satin
- felt
- terry cloth
- dotted swiss
- corduroy
- imitation fur material
- quilted materials
- rug scraps
- sandpaper
- leather
- venetian blind cord
- rubber doormat
- ridged rubber
- textured plastic
- leather (smooth)

TEXTURED PEGS I

Description:

Twelve large dowel pegs with plastic insulators for electric fence wire hammered on are placed in a peg board.

Purpose:

The large textured pegs are more inviting to children than small wooden ones.

Behavioral Objectives:

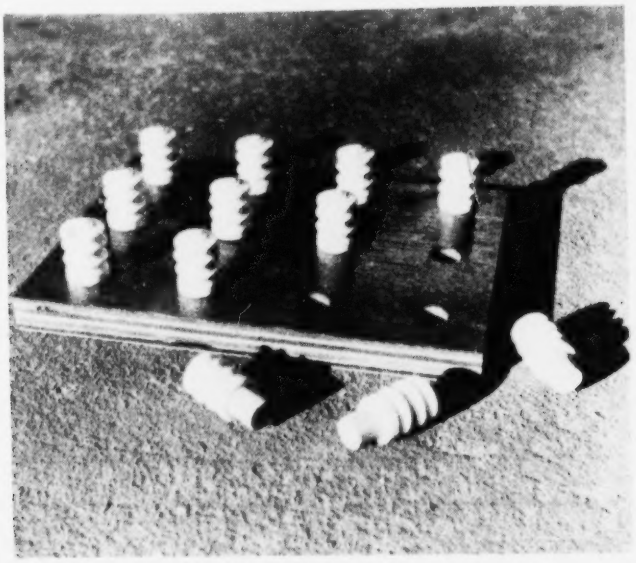
The child will willingly handle each peg and fit it into the hole as instructed.

Procedures and Use:

Like the textured beads, these pegs are used in the development of early hand manipulation. The skills of putting in and taking out are added to those already learned.

The child starts by removing pegs at random. As he starts replacing the pegs at random, he discovers the difference in the top and bottom of each peg and learns that they will fit in only one position—with the wooden portion down.

Finally he learns to follow directions for placement by row, top and bottom, left and right. This will probably be after he has had a considerable amount of additional readiness work and come back to the peg board.



Textured Pegs I

Step 1: From ¾" plywood cut a piece 9" × 12".

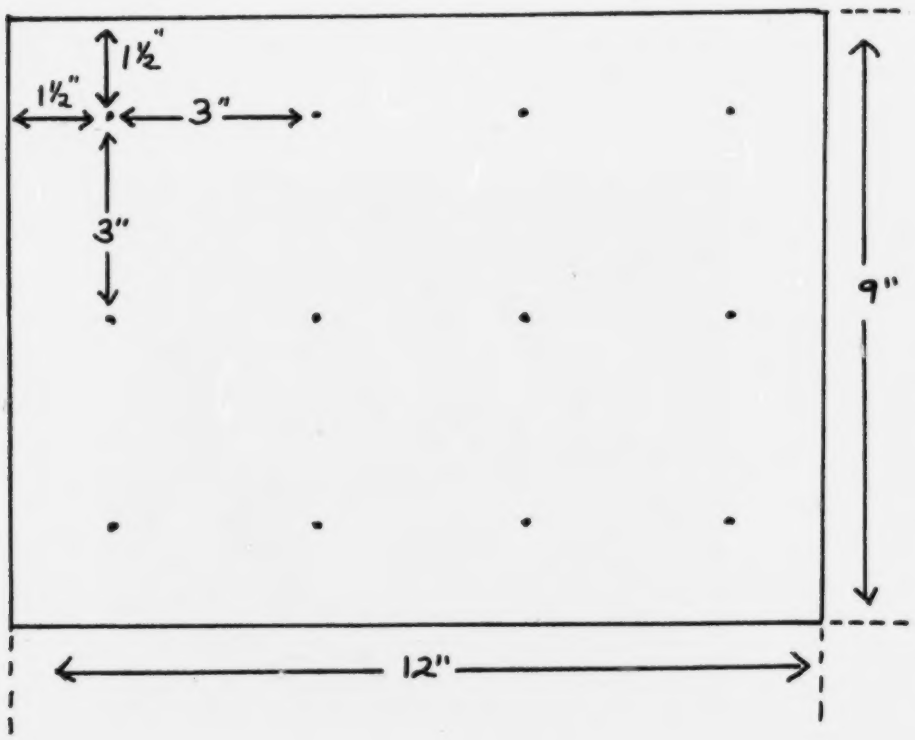
Step 2: From ¼" plywood cut a piece 9" × 12".

Step 3: In the ¾" × 9" × 12" board drill twelve holes 13/16" in diameter as shown in the diagram.

Step 4: Glue the two 9" × 12" boards together.

Step 5: From a ¾" diameter dowel cut twelve pegs 1⅞" high.

Step 6: Hammer plastic insulators for electric fence wire down approximately 1⅛" on the pegs, leaving an extension of no more than ¾". Use glue if necessary to hold the insulators in place.



TEXTURED PEGS II

Description:

Six distinct textures glued on the upper portion of twenty-four pegs (four of each texture) with upholstery tacks indicating the top, are placed in a peg board.

Purpose:

Along with being more interesting to manipulate, the pegs provide an opportunity for matching identical textures.

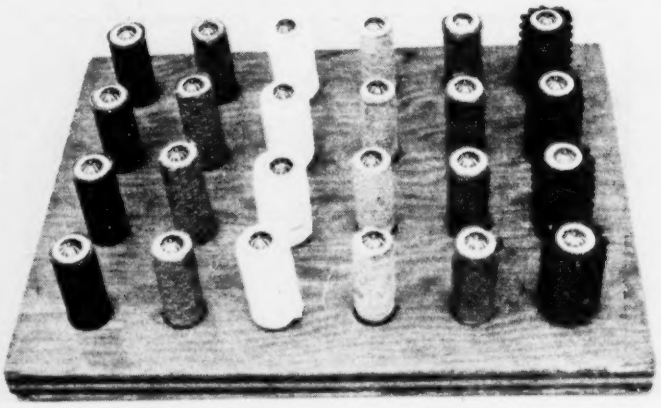
Behavioral Objective:

The child will demonstrate his recognition of identical textures by placing all like pegs in the same vertical row as instructed.

Procedures and Use:

This pegboard is used in the same way that Textured Pegs I is used. Additional readiness skills may be added — matching, alike and different. Placing the pegs in the board can bring in such spatial concepts as row alignment and columns. The increased number of pegs and textures gives an opportunity for placement according to verbal instructions.

Unlike the previous board, it is easy to get some of these pegs upside down since the upholstery tack is a rather subtle indication of the top of the peg. Therefore, this has to be pointed out to the child, making the word "top" meaningful.



Textured Pegs II

Step 1: From ¾" dowels cut twenty-four pegs 2½" high.

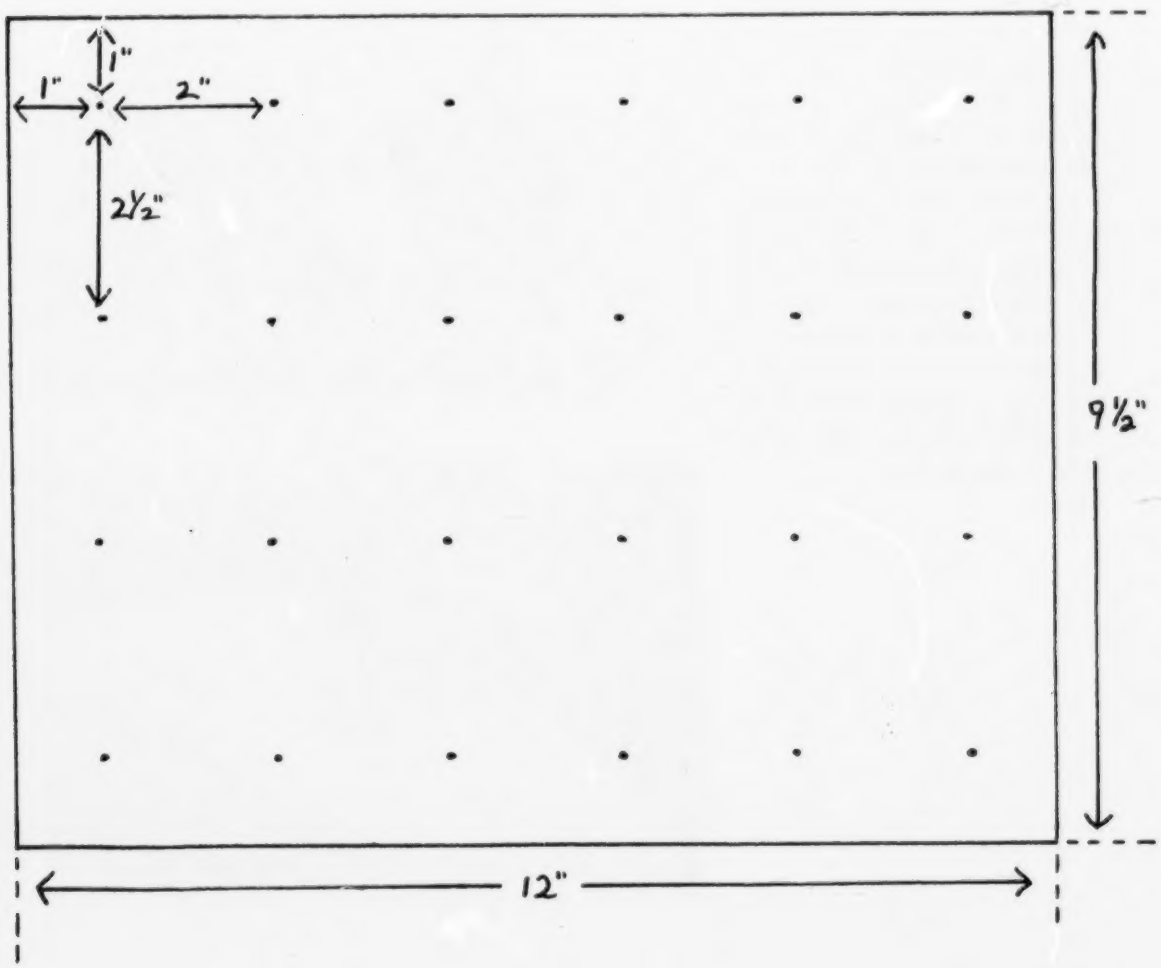
Step 2: Cover 1¾" of each peg with distinctive textures leaving the bottom ¾" plain. Used in the original were smooth leather, textured plastic, sandpaper, rubber doormat, felt, and venetian blind cord.

Step 3: Hammer a fancy upholstery nail into the top of each peg. (The top is the end **away** from the portion of the peg left plain.)

Step 4: Base: From ¾" plywood cut a piece 9½" × 12".
From ¼" plywood cut a piece 9½" × 12".

Step 5: In the 9½" × 12" × ¾" board drill twenty-four holes 13/16" in diameter as shown in the diagram.

Step 6: Glue the two pieces of the base together.



HAND POSITION PUZZLE

Description:

Two puzzle blocks shaped like hands are placed in a cut-out base.

Purpose:

Identifying his own hands with the puzzle pieces helps the child relate to the world around him.

Behavorial Objective:

After placing his hands on the hand blocks, the child will be able to remove the blocks, place his hands in the cutouts, and replace the blocks as instructed.

Procedures and Use:

The puzzle is coordinated with the child's own hands and other parts of his body. After showing the child both of his hands, then the left hand and the right hand, you show him the hand blocks in the puzzle. You ask him to remove the left one first and then the right one. Then he may place his hands in the open cutout spaces. The child then replaces the puzzle pieces randomly and then according to directions.

The concept of left and right is re-enforced by finger plays and games involving parts of the body.

Other Materials:

This puzzle is available from the American Printing House for the Blind.

Hand Position Puzzle

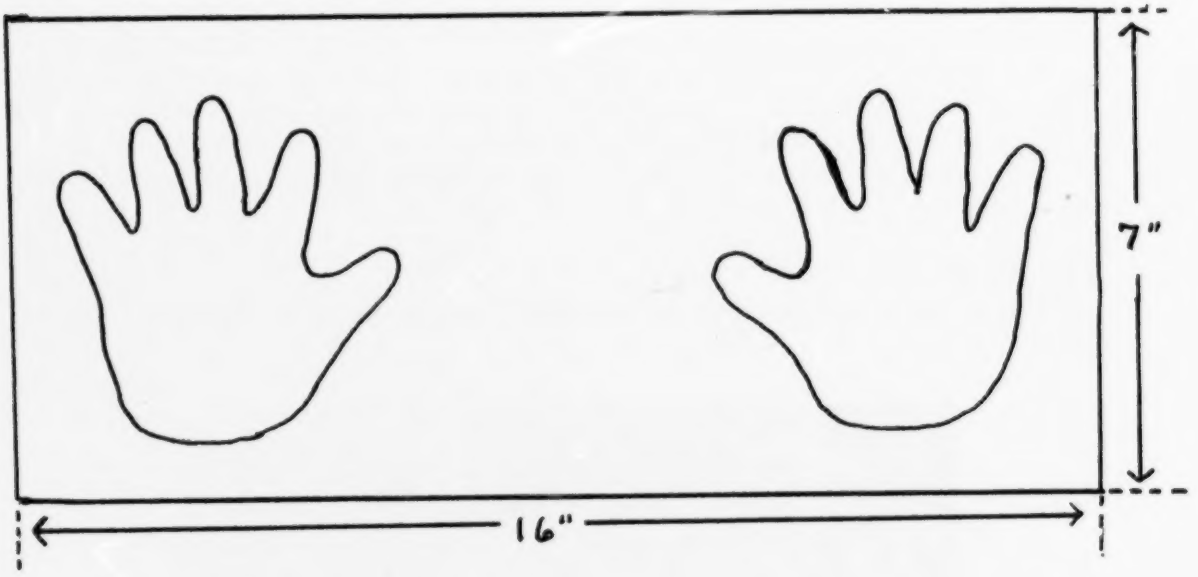
Step 1: From ¾" plywood cut two hand outlines measuring approximately 5" in each direction.

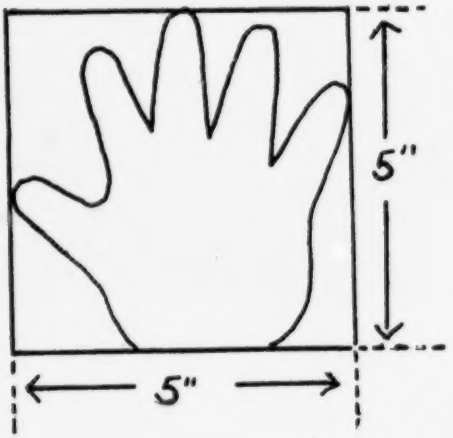
Step 2: Base: From ¼" plywood cut a piece 16" × 7".
From ½" plywood cut a piece 16" × 7".

Step 3: Trace the hand blocks (thumb in as shown) on the ½" × 16" × 7" board. Make cutouts large enough for the blocks to be fitted in easily.

Step 4: Glue the two sections of the base together.

Step 5: Paint the hands a bright color.





JUMBO FORMS

Description:

Large wooden shapes are painted different bright colors.

Purpose:

The large shapes are large enough for the child to handle and explore while learning to identify them.

Behavioral Objective:

The child will willingly examine tactually and identify by name the four basic forms.

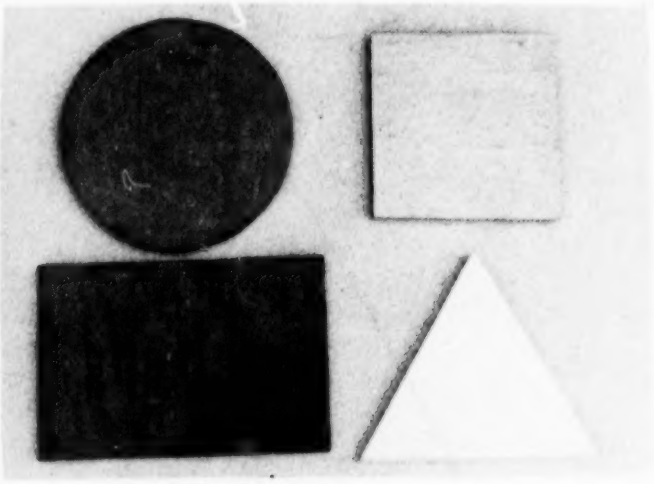
Procedures and Use:

These large wooden forms are the child's first introduction to shapes. They are presented one at a time, beginning with the circle, and a new shape is not introduced until the earlier ones are learned. For children with vision the different color of each shape is noted.

The circle is presented to the child first to hold in his hands, turn it, and examine its roundness. Then he puts it on the table to run his fingers around its edge.

Once he has some understanding of the circle shape, this is re-enforced with raised pictures of circles in different textures that he may take home.

Round objects in his environment, such as a plate or record, are introduced gradually.



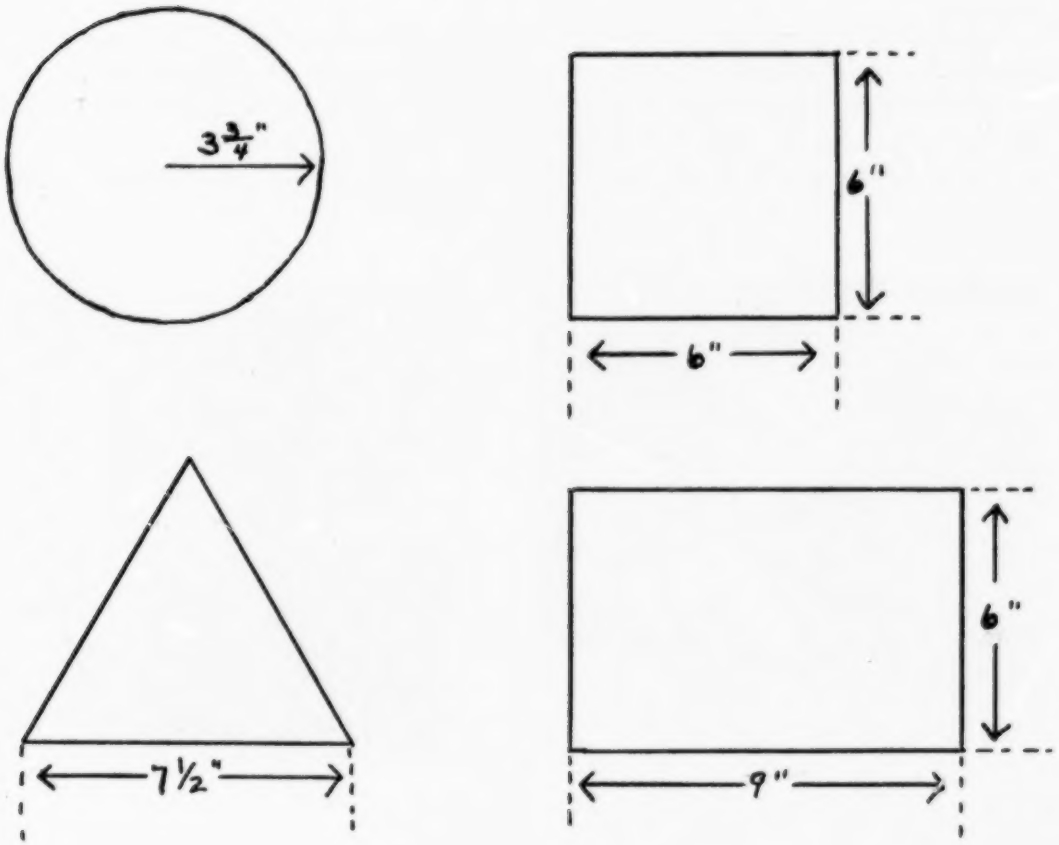
Jumbo Forms

Step 1: From ½" plywood cut a circle 7½" in diameter. Paint red on both sides.

Step 2: From ½" plywood cut a square 6" × 6". Paint blue on both sides.

Step 3: From ½" plywood cut an equilateral triangle with 7½" sides. Paint yellow on both sides.

Step 4: From ½" plywood cut a rectangle 6" × 9". Paint green on both sides.



FRAME - A - CIRCLE

Description:

Two sections of a circular picture frame are fitted into a grooved base.

Purpose:

The solid frame permits exploration of the outline of a circle and provides an opportunity for the child to "build" a circle.

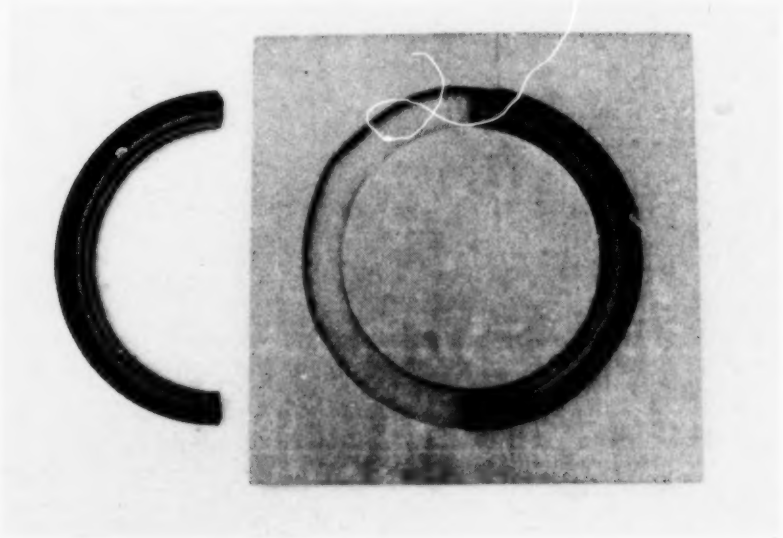
Behavioral Objective:

The child will willingly explore the frame, remove the two segments, trace the contour of the track with his finger, and replace the sections in the track.

Procedures and Use:

The Frame-A-Circle Board is presented to the child with the frame in place. After he runs his fingers around the frame, he identifies the shape and removes the pieces. He examines the groove in the base and replaces both sections of the frame. There is no possibility for error since the frame sections can be fitted into any portion of the groove and will even go in upside down.

The roundness of the frame and the groove is reemphasized. An added reenforcement is putting the Jumbo Circle, with which the child is familiar, and can identify, into the frame itself.



Frame-A-Circle

Step 1: Cut a commercial round picture frame 8¾" in diameter and ⅞" in width into two equal sections.

Step 2: Base: From ⅜" plywood cut a piece 12" × 12".
From ¼" plywood cut a piece 12" × 12".

Step 3: In the 12" × 12" × ⅜" piece make a circular cut-out 9" in diameter as shown in the diagram.

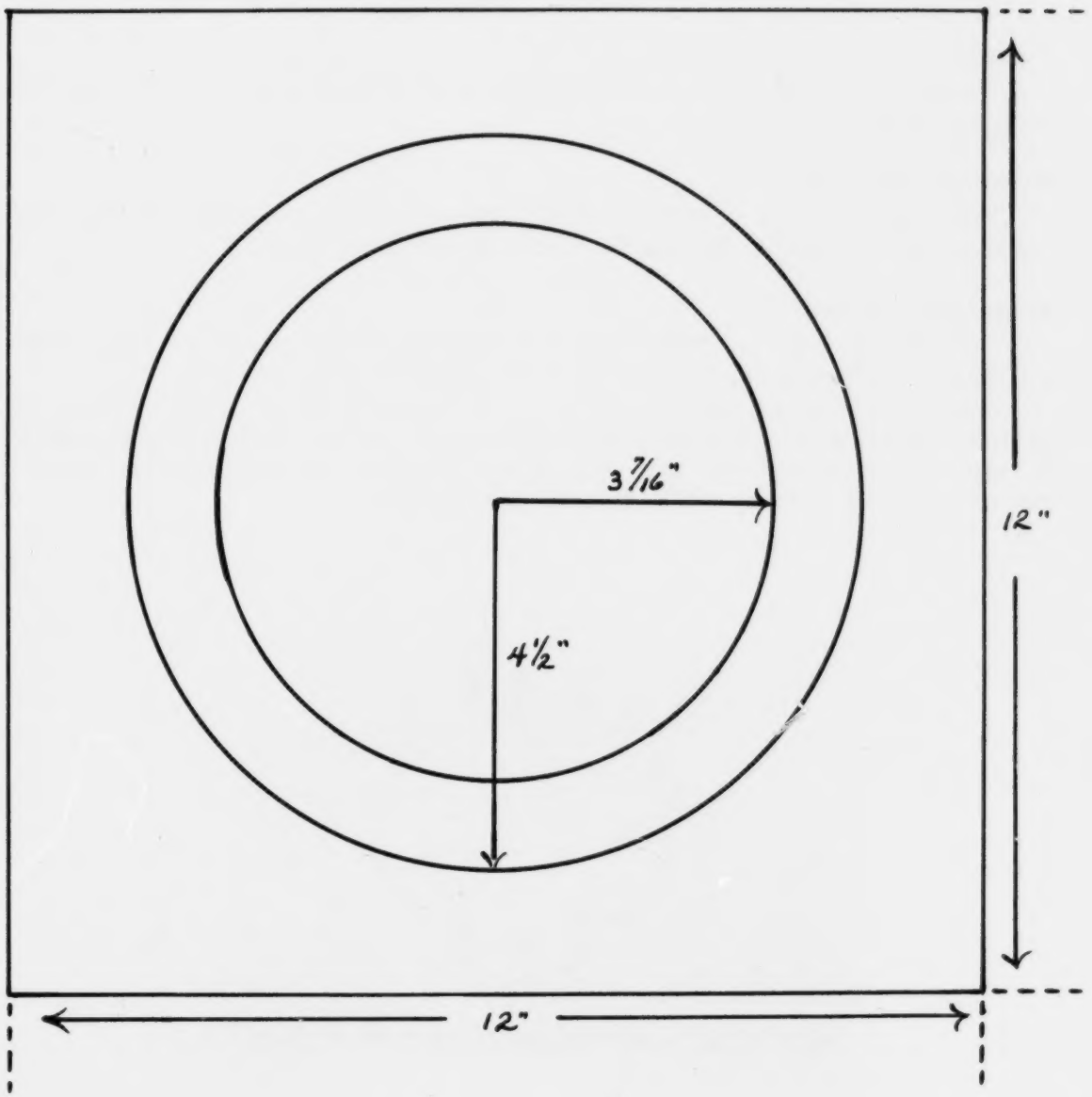
Step 4: Glue the two sections of the base together.

Step 5: From the circular center section left after making the circular cut-out in Step 3, cut a circle 6⅞" in diameter.

Step 6: Glue and nail the circle cut in Step 5 in the center of the 9" cut-out in the base, leaving a circular track in which the two sections of the frame cut in Step 1 fit easily.

Step 7: Paint the base red. Paint the two sections of the frame black.

Frame-A-Circle



PEG-A-CIRCLE

Description:

The sixteen holes in this peg board form a circle and dowel pegs are used.

Purpose:

The broken outline of the circle is slightly more difficult to discriminate than the solid outline in Frame-A-Circle.

Behavioral Objective:

The child will willingly examine tactually the circular pattern, remove the pegs, and replace them in sequential arrangement clockwise to form a circle.

Procedures and Use:

First the child is given the peg board with the pegs in place in order for him to trace around the contour with his finger. Then he removes the pegs randomly.

Next he replaces the pegs randomly, re-examining the shape. After he begins to grasp the pattern of the holes, he is helped to replace the pegs one by one in sequential order, starting at a designated spot. The concept of finding the "next" hole is a difficult one for many children and may take some time to master.

Peg-A-Circle

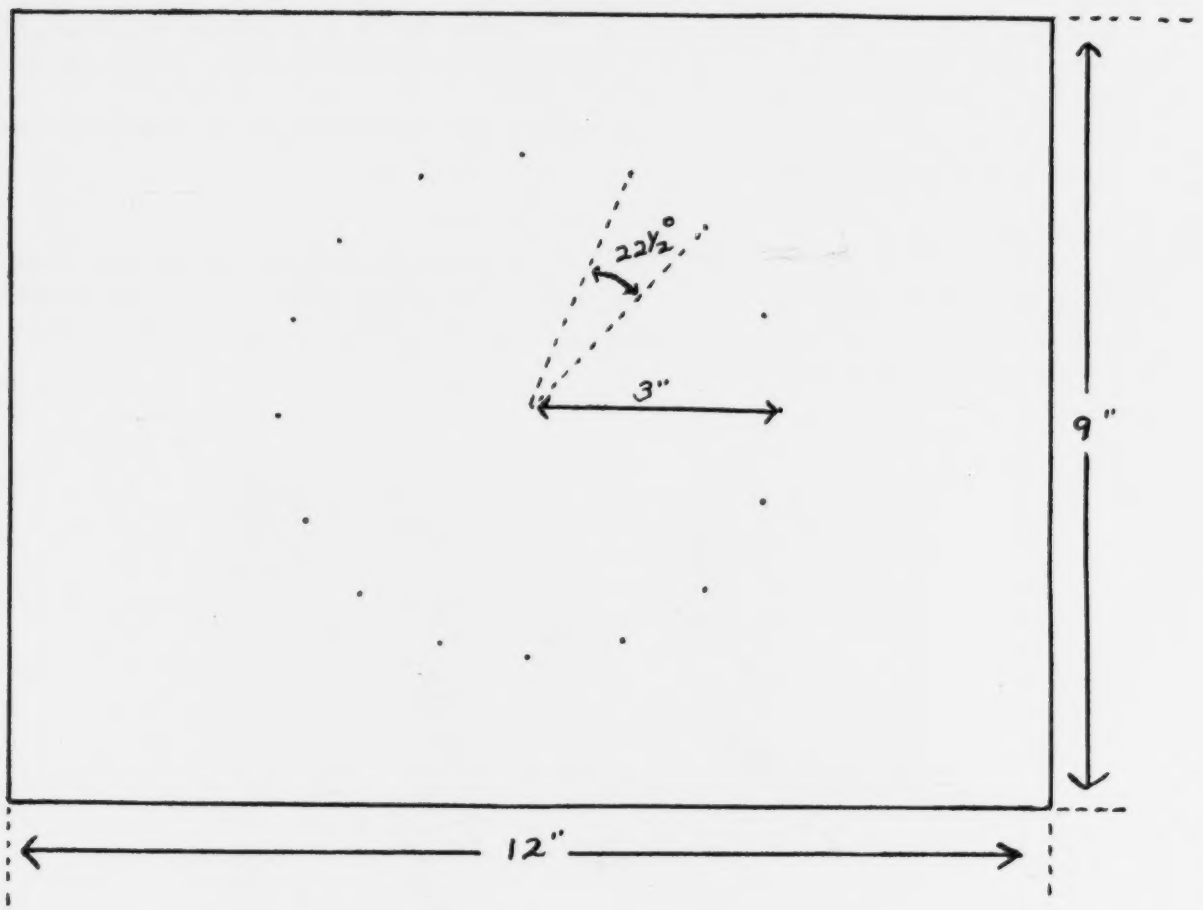
Step 1: From ⅜" dowels cut 16 pegs 1½" high.

Step 2: Base: From ¾" plywood cut a piece 9" × 12".
From ¼" plywood cut a piece 9" × 12".

Step 3: In the 9" × 12" × ¾" board make 16 holes with a 7/16" diameter at regular intervals as shown in the diagram.

Step 4: Glue the two sections of the base together.

Step 5: Paint the base a bright color; stain the pegs.



BIG AND LITTLE CIRCLES

Description:

Circular blocks of two sizes are fitted into cutouts.

Purpose:

The board introduces the concept of size difference to a shape that is already familiar.

Behavioral Objective:

The child will be able to remove and replace the two sizes of blocks in the appropriate cutouts as directed.

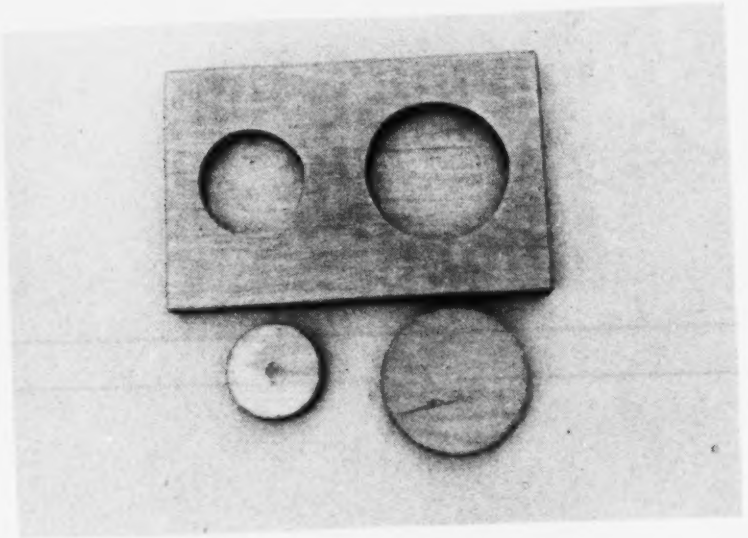
Procedures and Use:

The big and little pieces are presented to the child together. As he holds one in each hand, the size and shape of each are discussed. Then the child examines the puzzle board itself, looking at the big and little cutouts. The puzzle pieces are placed in the cutouts at random first, and then according to directions (big or little, left or right). The board may be presented in either direction.

The concept of big and little is reenforced with raised pictures, by comparison of familiar objects according to size, and by sorting activities.

Variations:

After form and size are familiar to the child a different texture may be introduced. The use of foam rubber circles and textured circular blocks will help the child become aware of different textures and weights, qualities of softness or unevenness of texture, and weight of the pieces. (see page 50)



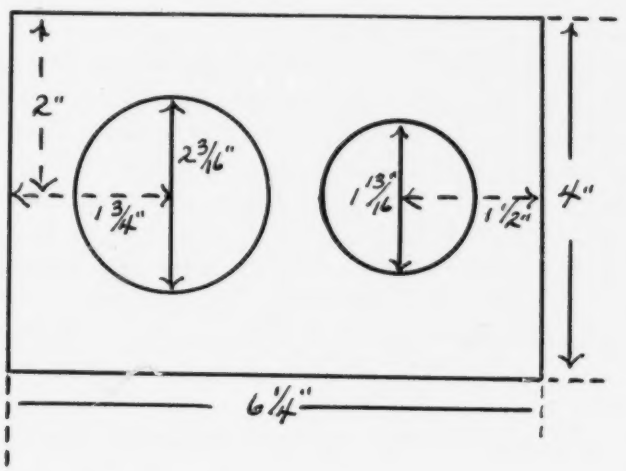
Big and Little Circles

Step 1: From ⅝" wood cut two circles with diameters 1⅝" and 2⅛".

Step 2: Base: From ⅜" plywood cut a piece 4" × 6¼".
From ¼" plywood cut a piece 4" × 6¼".

Step 3: In the 4" × 6¼" × ⅜" piece make two circular cut-outs with 1-13/16" and 2-3/16" diameters as shown in the diagram.

Step 4: Glue the two sections of the base together.



Variations:

A. Foam Rubber Circles
From 1" foam rubber cut one circle 2⅛" in diameter and one circle 1⅝" in diameter.

B. Textured Circles
Step 1: From ⅜" wood cut two circles with diameters 1¾" and 1¼". Paint a bright color.
Step 2: Glue the two painted blocks onto the underside of 2⅛" and 1¾" plastic carpet protectors.

SMALL, MEDIUM, AND LARGE CIRCLES I

Description:

Circular blocks of three sizes are fitted into cutouts.

Purpose:

The addition of an intermediate size block gives an opportunity for finer size discrimination and introduction of the concept of medium or middle size.

Behavioral Objective:

The child will be able to remove the circles and show recognition of the three different sizes by replacing them in their proper cutouts in any prescribed order such as small to large, etc. as directed.

Procedures and Use:

The child examines the three circular blocks in the board first and is told what each size is. He is asked to indicate the large and small circles which he already knows. Then he is asked to find the middle sized circle and helped to do so if necessary.

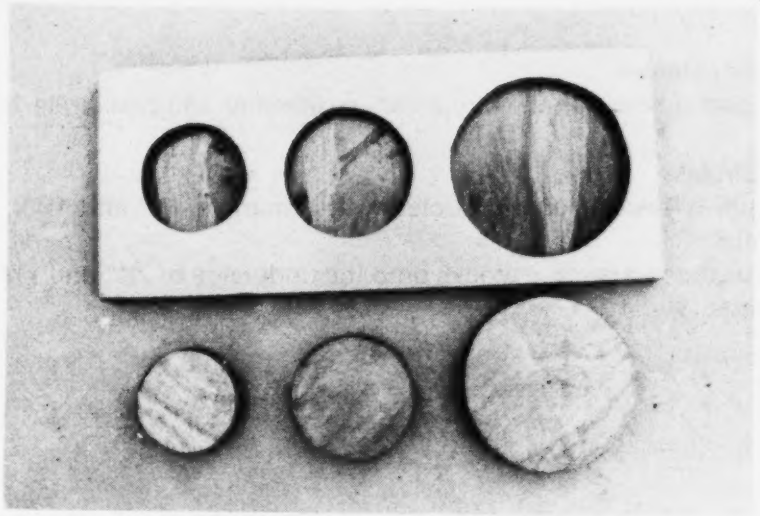
After removing the blocks in random order, he is again asked to find the large and small circles first and place them before finding and placing the medium size circle.

When he is asked to remove the blocks a second time, he is asked to find the new (Medium size) block first. Finally he is asked to replace the three sizes according to a prescribed order. The board may be presented in either direction.

This size concept may be reenforced similarly to that of Big and Little, page 22.

Other Materials:

Similar commercial form boards available in textured rubber.



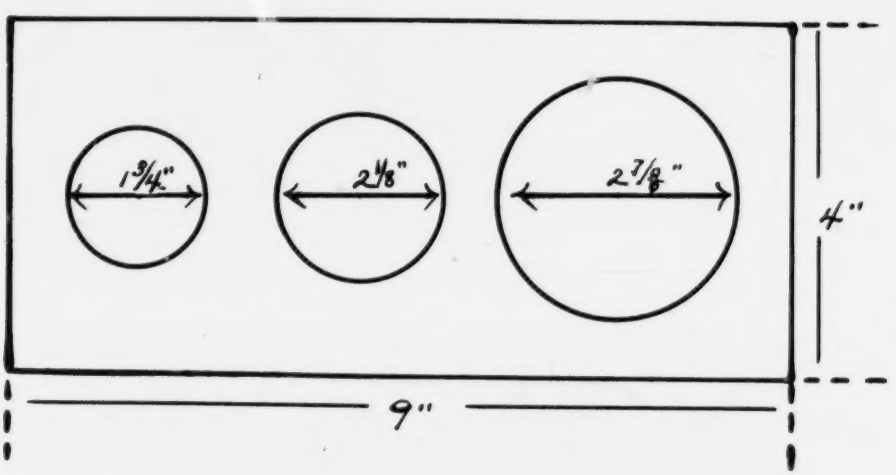
Small, Medium, and Large Circles I

Step 1: From ⅝" plywood cut circles with the following diameters: 2¾", 2", and 1⅝".

Step 2: Base: From ¼" plywood cut a piece 4" × 9".
From ⅜" plywood cut a piece 4" × 9".

Step 3: In the ⅜" × 4" × 9" board make three cutouts slightly larger than the blocks cut in Step 1, positioning them as shown in the diagram.

Step 4: Glue the two sections of the base together.



SMALL, MEDIUM, AND LARGE CIRCLES

Description:

Nine painted discs with diameters of three sizes are placed upon three dowel posts of different diameters and heights. The varying thicknesses of the discs make them even with the top of the post when correctly placed.

Purpose:

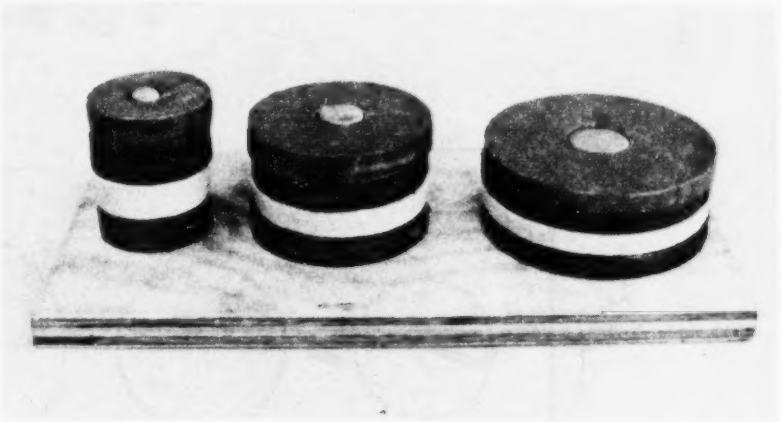
Size differences in three dimensions (diameter of the disc, diameter of the hole, and thickness of the discs) add complexity in size discrimination along with perception of three dimensions achieved with the vertical stacking of discs.

Behavioral Objective:

The child will be able to remove all of the circular discs from the dowel sticks and after examination of the center hole and size of the block, replace each circle on the appropriate post.

Procedures and Use:

This board is used for color identification, taking off and putting on, stacking, comparison of size, matching size, and matching color. Concepts of left, right, and middle and progression of size can be re-emphasized.



Small, Medium, and Large Circles II

Step 1: Cut a board ⅝" × 6" × 11¼".

Step 2: Cut three dowels as follows:
½" dowel 3⅛" long
¾" dowel 2⅝" long
1" dowel 2⅛" long.

Step 3: Drill holes through the base and insert dowels as shown in the diagram. Glue if necessary. (Measurements are to the center of the holes.)

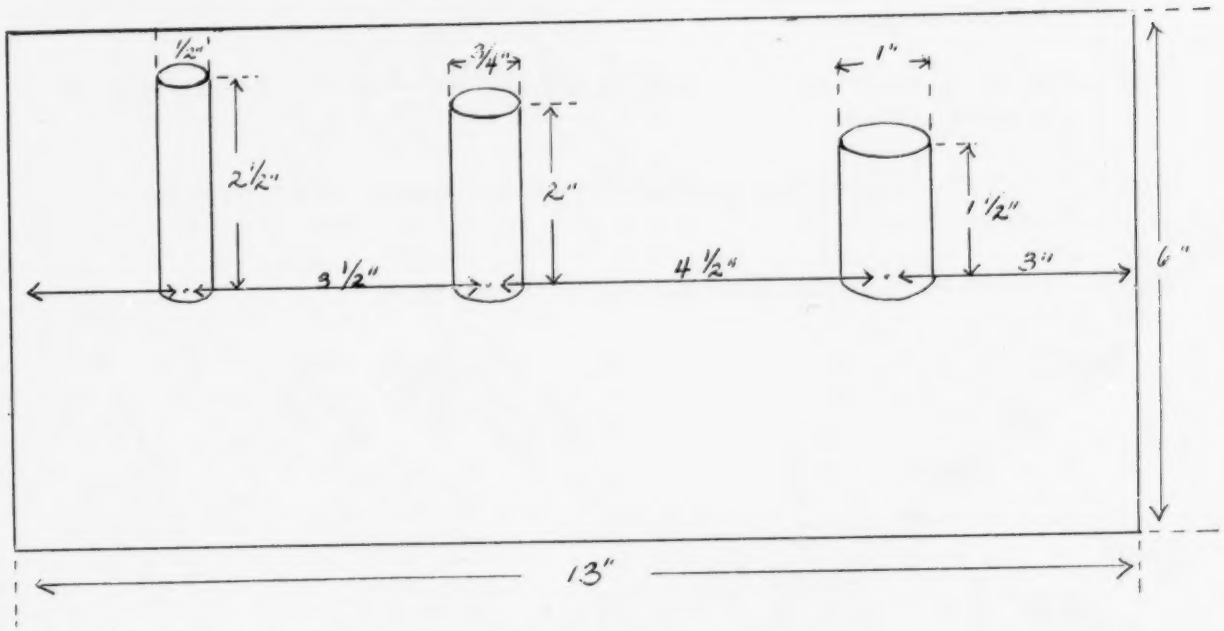
Step 4: From ⅝" plywood cut four circular blocks 2" in diameter. Drill a 9/16" hole in the center of each.

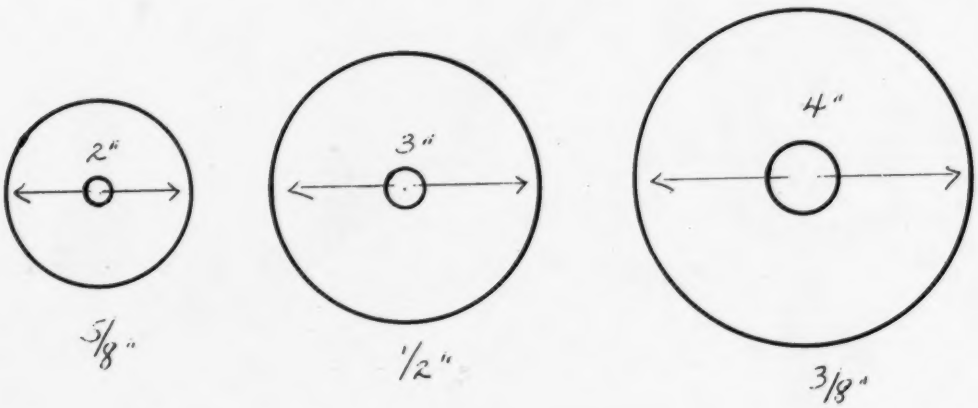
Step 5: From ½" plywood cut four circular blocks 3" in diameter. Drill a 13/16" hole in the center of each.

Step 6: From ⅜" plywood cut four circular blocks 4" in diameter. Drill a 1-1/16" hole in the center of each.

Step 7: Paint one block of each size red, blue, yellow, and green.

Small, Medium, and Large Circles II





HARD AND SOFT PEGS

Description:

Two wooden balls and two sponge rubber balls are pegged into the four corners of a wooden base.

Purpose:

The terms "hard" and "soft" can be illustrated as the child squeezes the peg-balls and compares the different degrees of resistance to pressure and touch, and matches them accordingly.

Behavioral Objective:

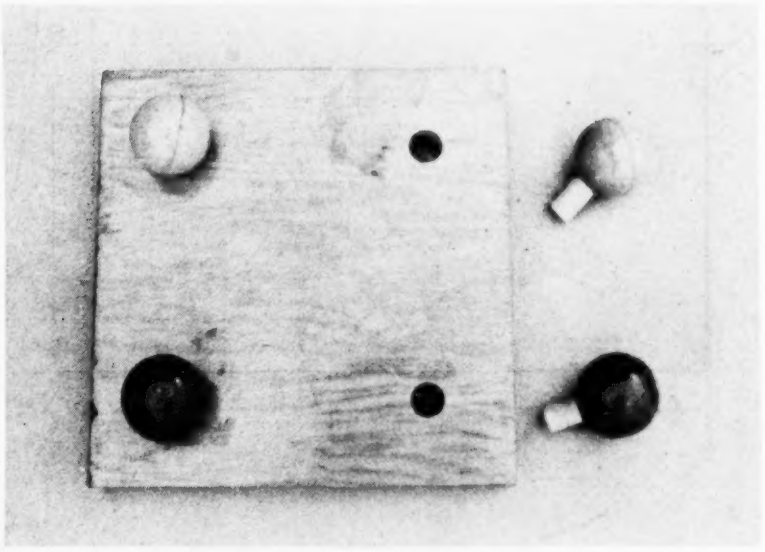
The child will be able to match or contrast soft rubber and wooden ball pegs according to instructions by placing them in the base.

Procedures and Use:

The hard and soft peg board appears in the sequence of learning at this point as a continuation of the concept of roundness.

A discussion of hard and soft toys already familiar to the child should precede and parallel its presentation as a matching board for hard and soft pegs. When he understands the difference in the two terms, he can locate the hard and soft knobs in various positions, and match them. The concepts of corners, left, right, top, and bottom can be incorporated.

The concept of hard and soft can be reenforced by comparing a variety of hard and soft objects from the child's surroundings.



Hard and Soft Pegs

Step 1: From ¾" plywood cut a piece 9" × 9".

Step 2: From ¼" plywood cut a piece 9" × 9".

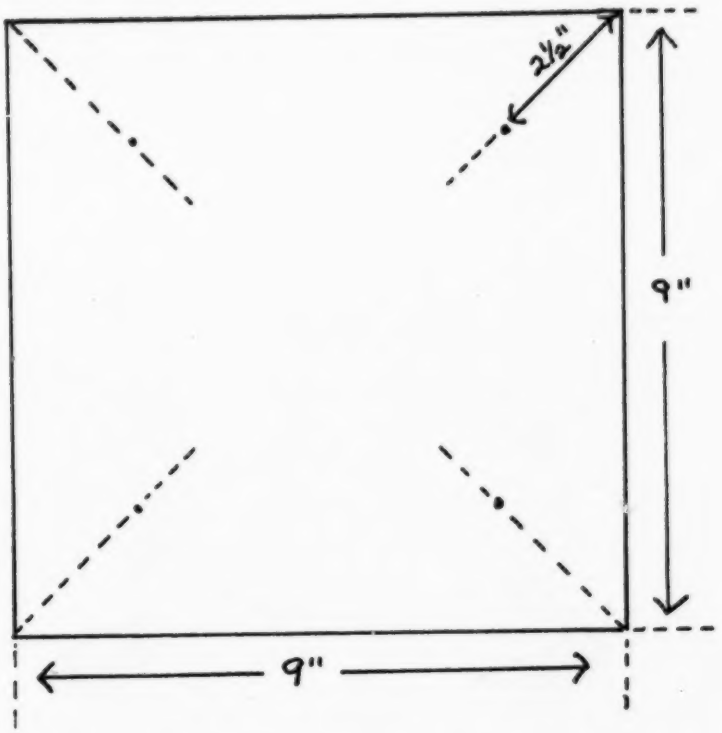
Step 3: In the 9" × 9" × ¾" board drill four holes 11/16" in diameter in the positions shown in the diagram.

Step 4: Glue the two 9" × 9" boards together.

Step 5: In two sponge rubber balls approximately 1¾" in diameter insert a ⅝" diameter dowel leaving a ⅞" extension as shown in the photograph. Glue.

Step 6: In two round wooden drawer pulls approximately 1¾" in diameter insert a ⅝" diameter dowel leaving a ⅞" extension as in Step 5. Glue.

Step 7: Paint the wooden balls the same color as the rubber balls. (red)



CONTOUR SMALL, MEDIUM, AND LARGE

Description:

Halves of sponge rubber balls mounted on wooden discs are placed in cutouts, matching the two sections and comparing relative sizes.

Purpose:

The rounded surfaces of the blocks gives added interest to the sequencing of blocks according to size.

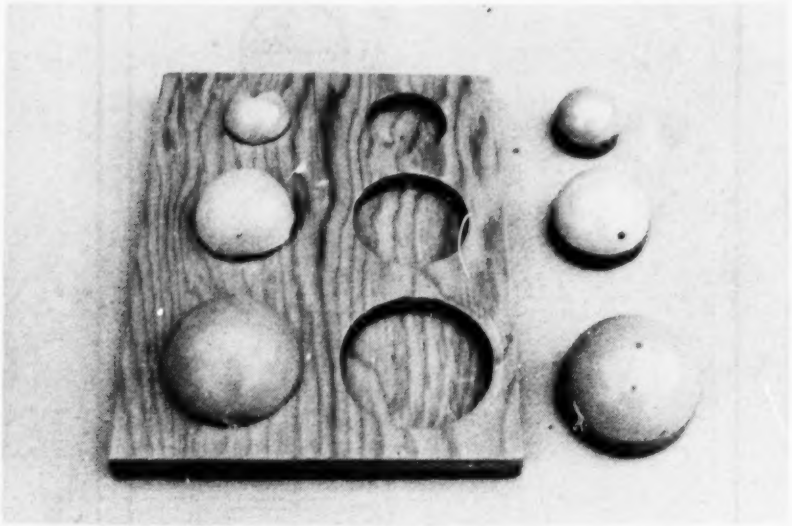
Behavioral Objective:

The child will be able to remove all pieces, examine them, and replace them in the appropriate part of the board in any prescribed order such as small to large, etc. as instructed.

Procedure and Use:

Since the child has already become aware of the three sizes, he does not need as many steps as were used in Small, Medium and Large Circles I. The added roundness contour of these pieces adds an enrichment factor.

In addition to recognizing the small, medium and large size difference, the child is asked to match the two halves of the ball.



Contour Small, Medium, and Large

Step 1: Cut soft sponge rubber balls approximately 2¼", 1¾", and 1¼" in diameter into two equal pieces. The balls should be the same color.

Step 2: From ⅜" plywood cut three circular blocks 2¼", 1¾", and 1¼" in diameter. Sand and varnish.

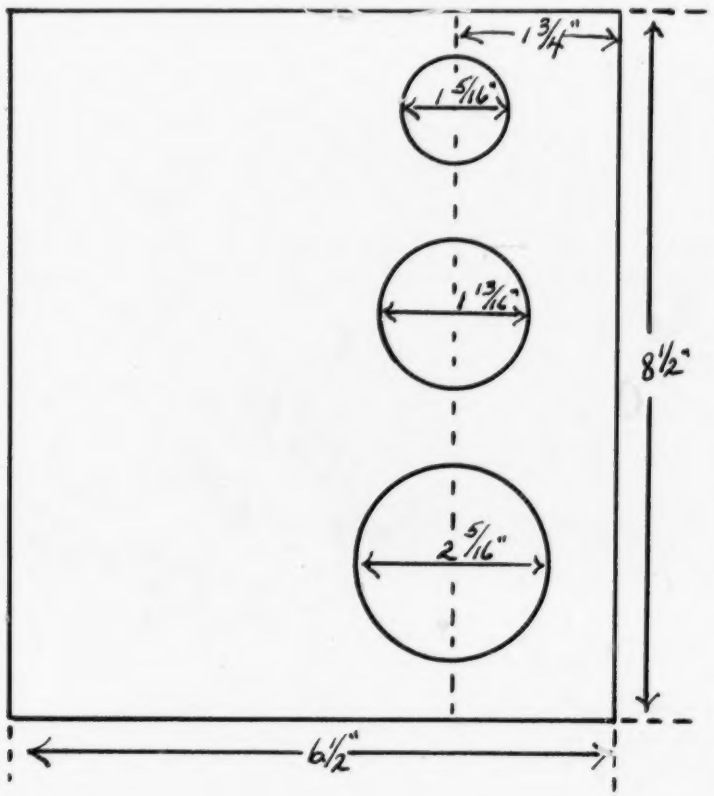
Step 3: Glue half of each ball cut in Step 1 to each of the three blocks cut in Step 2 according to size.

Step 4: Base: From ⅜" plywood cut a piece 6½" × 8½".
From ¼" plywood cut a piece 6½" × 8½".

Step 5: In the piece of wood 6½" × 8½" × ⅜" make three circular cut-outs as shown in the diagram.

Step 6: Glue the two sections of the base together.

Step 7: After the base is varnished glue the remaining half of each ball opposite the appropriate cut-out as shown in the photograph.



ALIKE AND DIFFERENT CIRCLES

Description:

This board has one row of four circular blocks. The different block is larger and is painted a contrasting color.

Purpose:

The factor of difference in this board is that of size with the added clue of color.

Behavioral Objective:

The child will demonstrate his recognition of size by selecting the block that is different, placing it in its proper cutout, and then placing the remaining like circles in their cutouts.

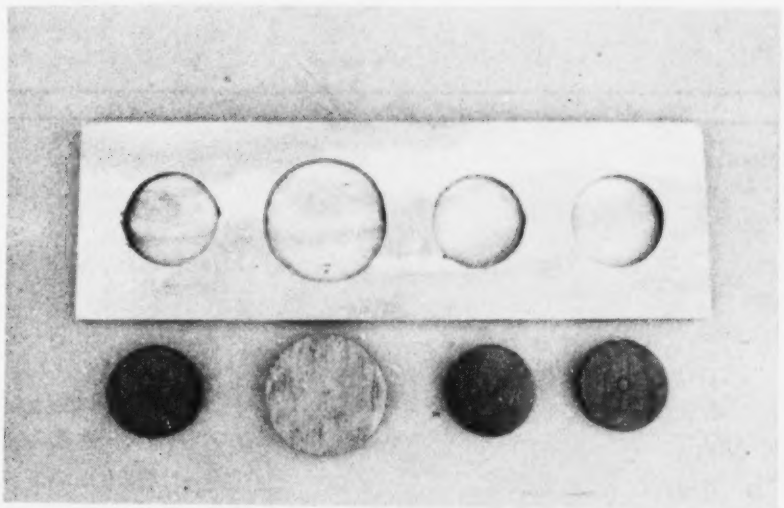
Procedure and Use:

The child examines the blocks in the board and identifies the shapes (all circles). He is asked to find the big circle, remove it, and examine it in his hands. Then he is asked to find the small circles, remove, examine and compare them. The teacher explains that since there is only one big circle, it is different from the others, and that the little ones are all alike because they are all the same size.

After replacing the blocks in the board, the teacher asks the child to find the one that is different in the board and the ones that are alike in the board. When he removes the pieces he is asked to identify alike and different blocks outside the board.

The child replaces the blocks in their correct places in the board randomly and then following directions.

This concept is reenforced through games, raised pictures, sorting, and classification.



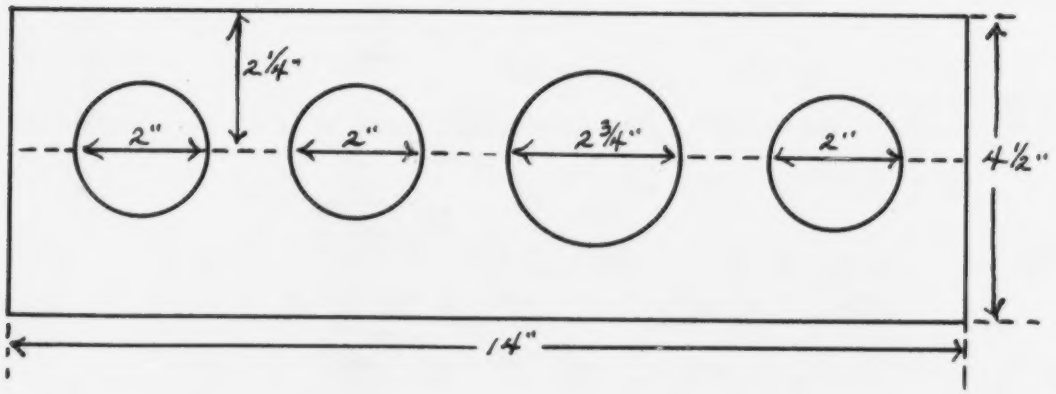
Alike and Different Circles

Step 1: From ⅝" plywood cut three circular blocks with a diameter of 1⅞" and one circular block with a diameter of 2⅝". Paint the three small blocks a bright color and the large block a contrasting color.

Step 2: From ¼" plywood cut two pieces 4½" × 14" for the base.

Step 3: In one of the 4½" × 14" × ¼" pieces cut in Step 2, make three circular cutouts with 2" diameters and one circular cutout with a diameter of 2¾" as shown in the diagram.

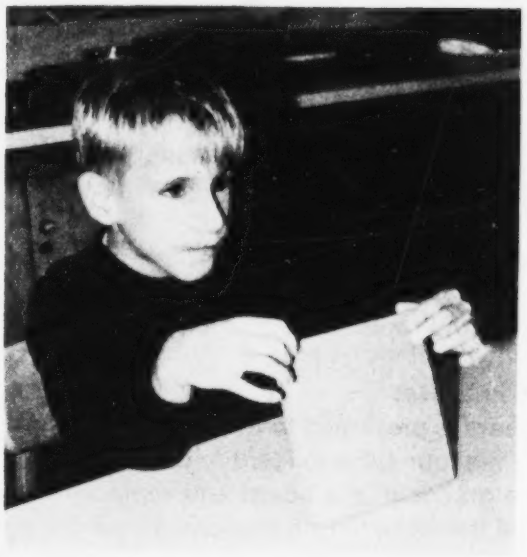
Step 4: Glue the two pieces of the base together.



JUMBO FORMS

Before the child is introduced to **each** new shape, that Jumbo Form should be reintroduced.

Here the emphasis is on the Jumbo Square. The child is shown that it has four straight sides which he can count and that all four sides are the same in length.



By actual comparison of the large shapes, the child learns that there are definite differences between a square and a circle.

Such comparisons should be made with the introduction of each new shape.

FRAME - A - SQUARE

Description:

Four mitered strips of equal length fit into a grooved base to form a square.

Purpose:

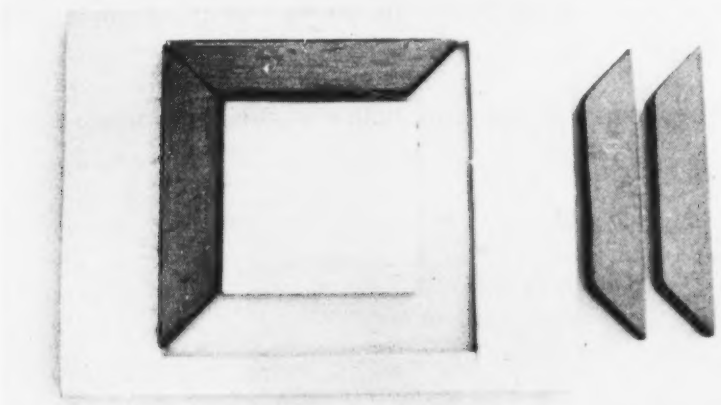
The four solid segments of the square provide an opportunity for thorough exploration of straight sides and corners and allow the child to build a square.

Behavioral Objective:

The child will explore tactually the square frame, remove the pieces, examine the cutout track, and replace the four pieces in the groove.

Procedure and Use:

The board is presented to the child with the square frame in place. He runs his fingers along the four sides to identify the shape. After removing the four sections, he examines the groove in the board and replaces the sections of the frame. Although the sides are all the same length and can be placed with either side up, the long edge must be toward the outside of the groove for the corners to fit correctly.



Frame-A-Square

Step 1: From ¾" wood cut four pieces 1¼" wide and 6⅞" long.

Step 2: Miter the ends of the four strips at 45° angles to form the four sides of a square frame.

Step 3: Base: From ⅜" plywood cut a piece 9" × 12".
From ¼" plywood cut a piece 9" × 12".

Step 4: In the 9" × 12" × ⅜" piece make a square cut-out 7⅛" × 7⅛" as shown in the diagram.

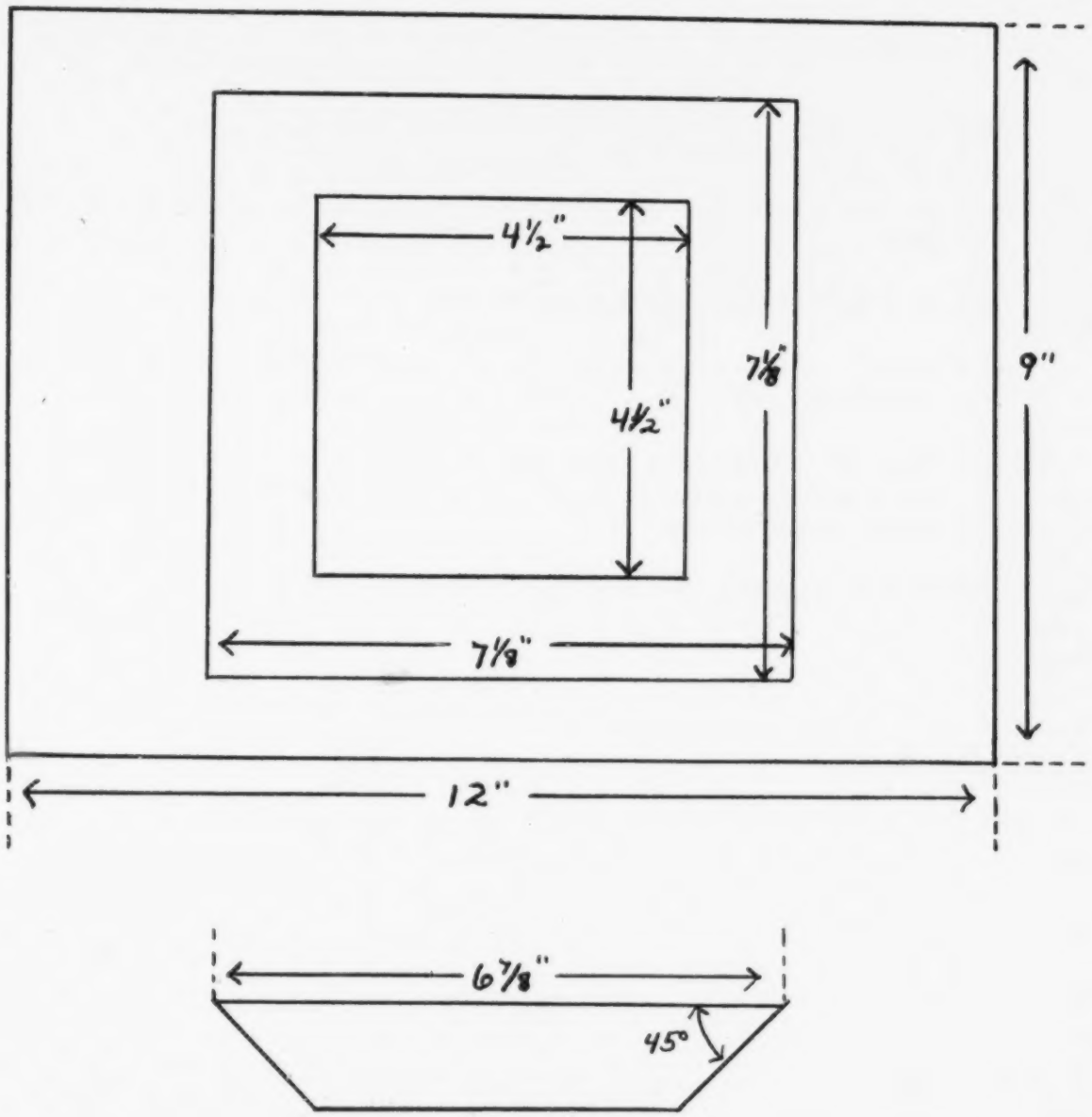
Step 5: Glue the two sections of the base together.

Step 6: From the square center section left after making the square cut-out in Step 4, cut a square 4½" × 4½".

Step 7: Glue and nail the square cut in Step 6 in the center of the 7⅛" × 7⅛" cut-out in the base, leaving a square track in which the four sections of the frame cut in Steps 1 and 2 fit easily.

Step 8: Paint the base blue. Paint the four sections of the frame black.

Frame-A-Square



PEG-A-SQUARE

Description:

The twenty-four holes in this pegboard form a square. Dowel pegs are used.

Purpose:

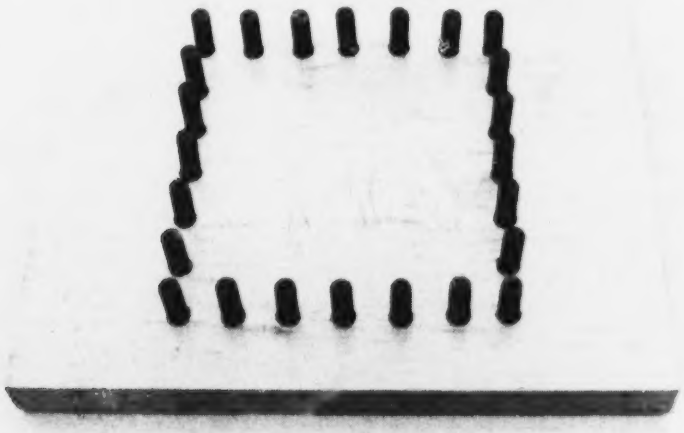
The broken outline of the square is slightly more difficult to identify than the solid outline in Frame-A-Square.

Behavioral Objective:

The child will be able to remove all pegs and replace them in straight lines consecutively to form a square from the upper left corner across the top, down the right side, across the bottom, and up the left side as instructed.

Procedure and Use:

The child examines the peg board with the pegs in place and traces the four sides of the square with his finger. Then he removes and replaces the pegs randomly until he understands the pattern of the peg holes. Finally he replaces the pegs one by one in sequential order, starting at a designated corner.



Peg-A-Square

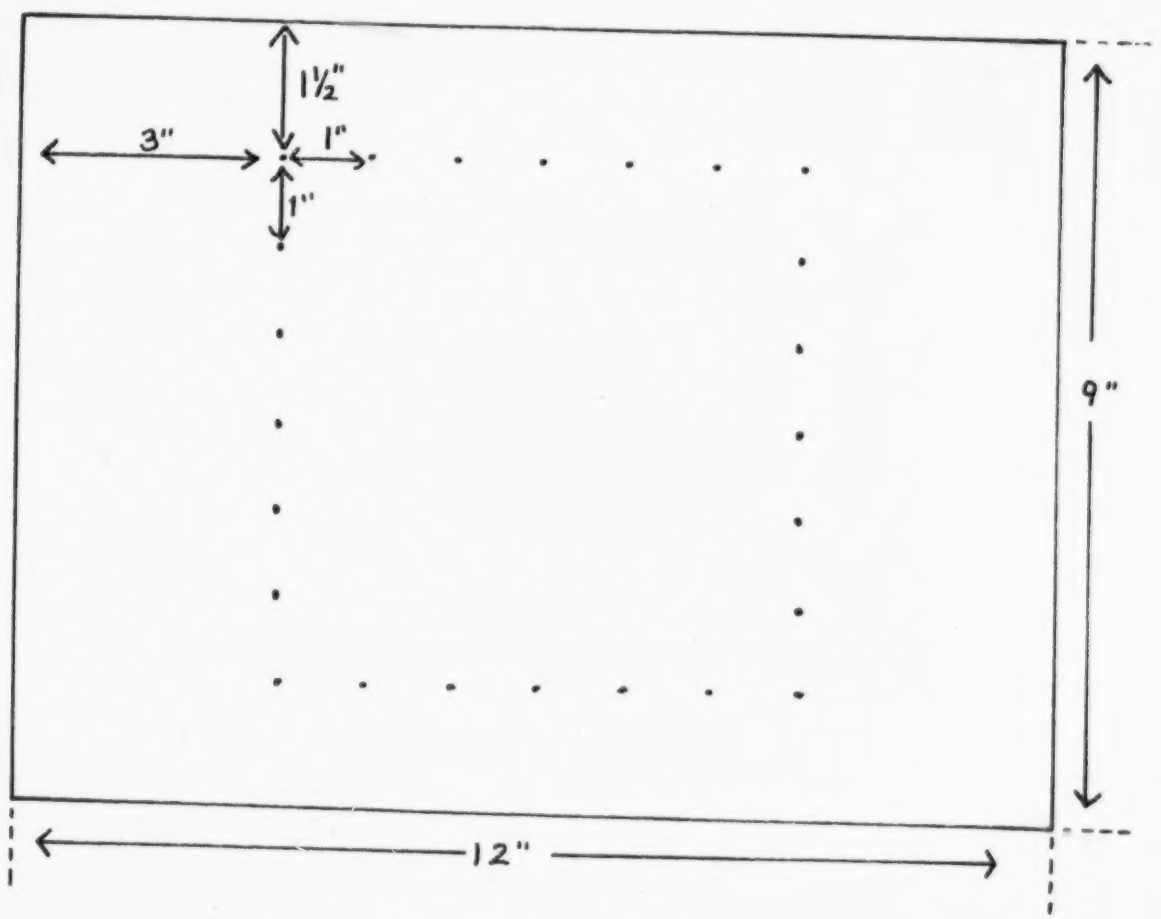
Step 1: From ⅜" dowels cut 24 pegs 1½" high.

Step 2: Base: From ¾" plywood cut a piece 9" × 12".
From ¼" plywood cut a piece 9" × 12".

Step 3: In the 9" × 12" × ¾" board make 24 holes with a 7/16" diameter at 1" intervals as shown in the diagram.

Step 4: Glue the two sections of the base together.

Step 5: Paint the base a bright color; stain the pegs.



BIG AND LITTLE SQUARES

Description:

Square wooden blocks of two sizes are fitted into cutouts.

Purpose:

The concept of size difference is introduced to a shape that is familiar.

Behavioral Objective:

The child will demonstrate his recognition of the difference in size by removing the big and little square blocks and replacing them in the appropriate cutouts upon direction.

Procedure and Use:

The same procedure followed with Big and Little Circles (page 22) is followed with this teaching aid, including reenforcement activities.

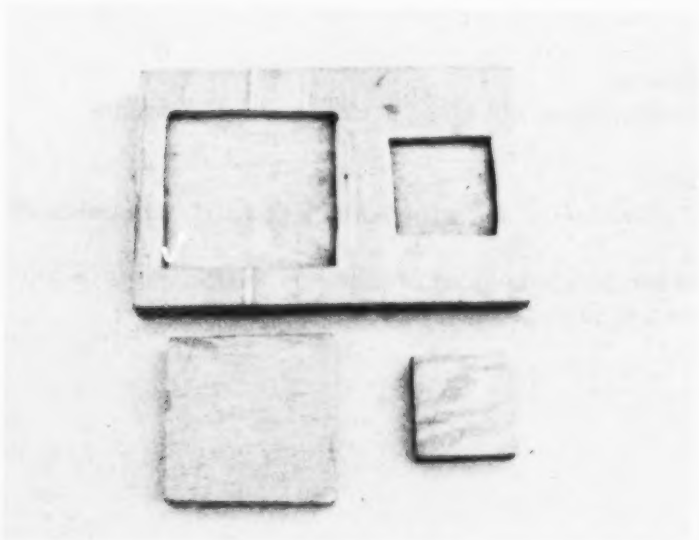
Variations:

After the form and size differences of the squares have become familiar to the child, a different texture may be introduced as it was in the comparable circle board (see page 50).

The foam rubber and uneven textures will be familiar to the child and he can become aware of the constancy of shape in spite of other variables.

Other Materials:

Larger big and little squares with handles are available.



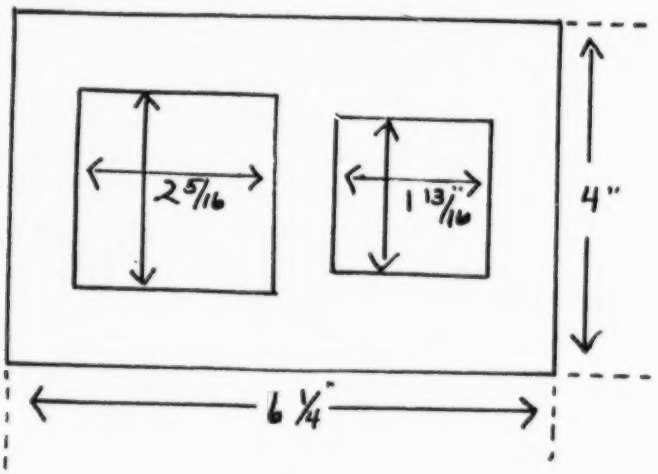
Big and Little Squares

Step 1: From ⅝" plywood cut a 2¼" × 2¼" block and a 1¾" × 1¾" block.

Step 2: Base: From ⅜" plywood cut a piece 4" × 6¼".
From ¼" plywood cut a piece 4" × 6¼".

Step 3: In the 4" × 6¼" piece make a 2-5/16" square cut-out and a 1-13/16" square cut-out as shown in the diagram.

Step 4: Glue the two sections of the base together.



Variations:

A. Foam Rubber Squares
From 1" thick foam rubber, cut a 2⅛" square and a 1⅝" square.

B. Textured Squares
Step 1: From ⅜" plywood cut a 2" square block and a 1½" square block. Paint a bright color.
Step 2: Glue the two painted blocks onto the underside of 2¼" × 2¼" and 1¾" × 1¾" plastic carpet protectors.

SMALL, MEDIUM, AND LARGE SQUARES

Description:

Square wooden blocks of three sizes are fitted into cutouts.

Purpose:

The concept of an intermediate size between small and large is extended to a new shape.

Behavioral Objective:

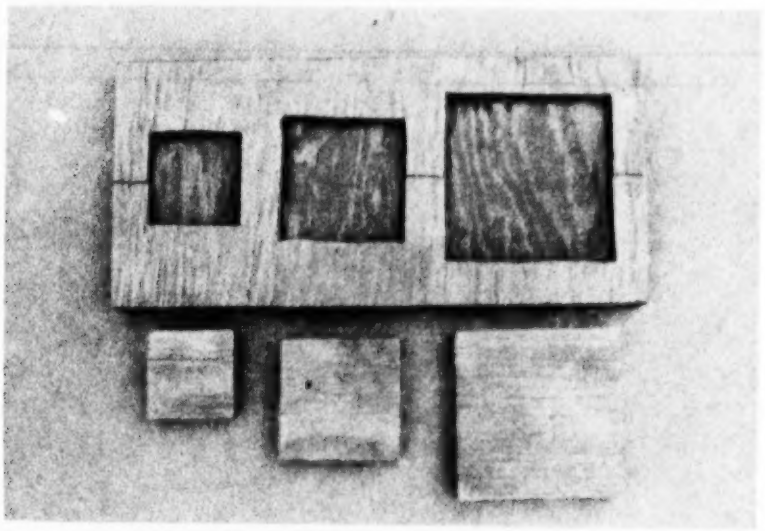
The child will be able to remove the square blocks and show recognition of the three different sizes by replacing them in their proper cutouts in any prescribed order such as small to large, etc. as directed.

Procedure and Use:

The same procedure followed with Small, Medium, and Large Circles I (page 24) is followed with this teaching aid, including re-enforcement activities.

Other Materials:

Similar commercial form boards available in textured rubber.



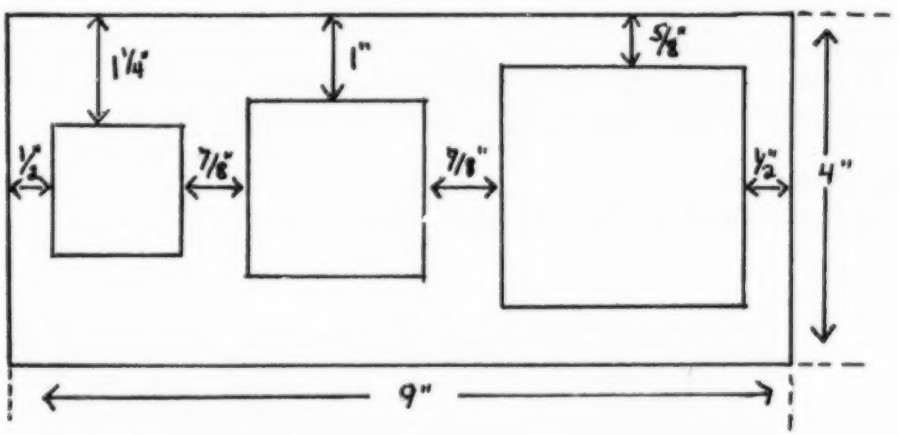
Small, Medium, and Large Squares

Step 1: From ⅝" plywood cut squares the following sizes: 1½" × 1½"; 2" × 2"; 2¾" × 2¾".

Step 2: Base: From ¼" plywood cut a piece 4" × 9".
From ⅜" plywood cut a piece 4" × 9".

Step 3: In the ⅜" × 4" × 9" piece make three cutouts slightly larger than the blocks cut in Step 1 as shown in the diagram.

Step 4: Glue the two pieces of the base together.



TEXTURE MATCHING BLOCKS

Description:

Six square blocks having distinctive textures are matched to six cutouts having the same textures.

Purpose:

The board allows for tactual matching of the same textures, recognition of types of textures, and identification of textures by name.

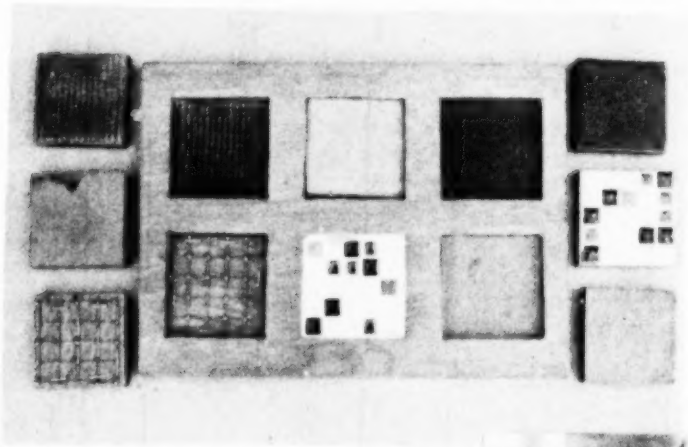
Behavioral Objectives:

The child will be able to match the textured blocks with the identically textured cutouts.

Procedure and Use:

Present the child with one block out of the board. Use a particularly smooth or rough one for this initial introduction. Then present the other blocks one at a time.

When the cutout board without the blocks is shown to the child he feels inside each cutout while the teacher identifies the character of each texture for him. The child now takes one block at a time and matches it to the corresponding texture.



Later the board may be used to re-enforce previously mastered concepts of position. Different textures of clothing, texture samples, and textured pictures and books expand the child's knowledge of texture differences.

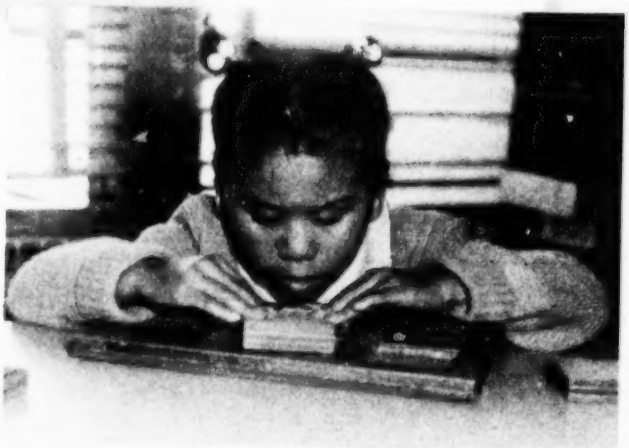
Variations:

A. A four block board can be made if this board seems too difficult.

B. If a board is not desired, the textured blocks can be made in pairs and used that way.

Other Materials:

Textured rubber discs are available.



Texture Matching Blocks

Step 1: From ½" plywood cut six blocks 2⅜" square.

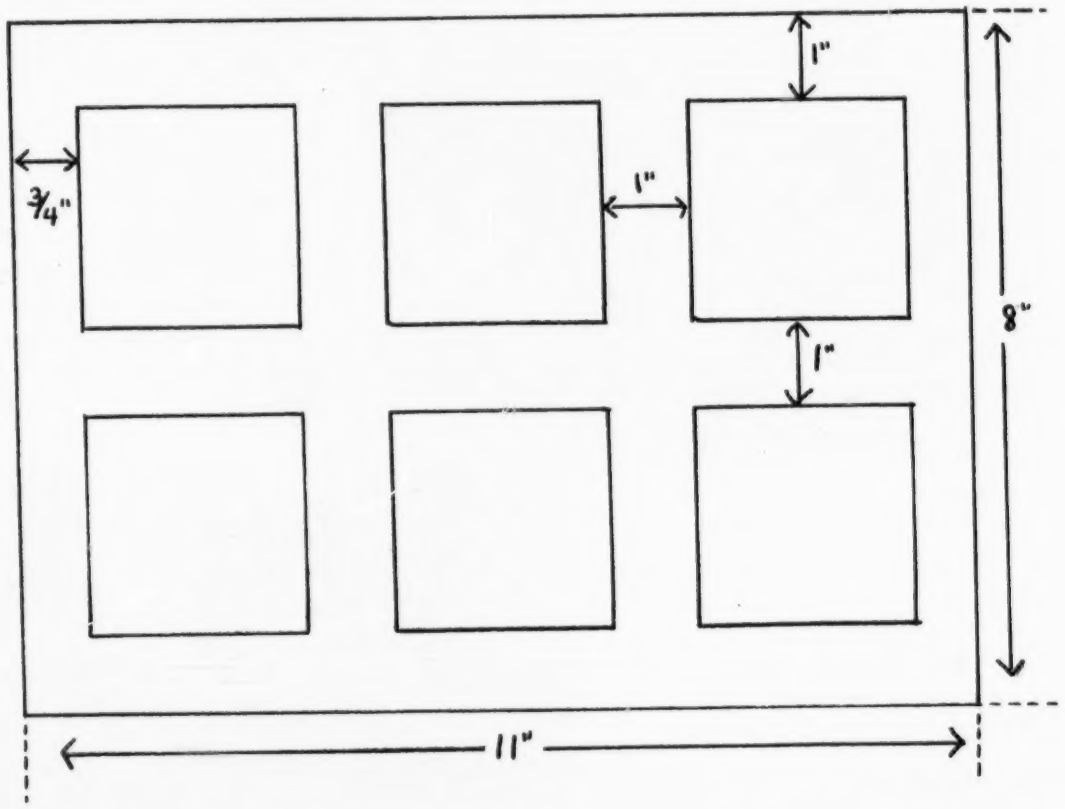
Step 2: Base: From ¼" plywood cut a piece 11" × 8".
From ⅜" plywood cut a piece 11" × 8".

Step 3: In the ⅜" × 11" × 8" board make six 2½" square cutouts as shown.

Step 4: Glue the two pieces of the base together.

Step 5: Mount six materials with distinctive textures on the blocks cut in Step 1. The following materials were used in the original: sponge, ceramic tile, sand paper, ½" wire mesh, satin, wide-wale corduroy.

Step 6: Glue identical textures into the cutouts in the base.



ALIKE AND DIFFERENT SQUARES

Description:

This board has one row of four square blocks. The different square block is larger and has a different texture than the other three.

Purpose:

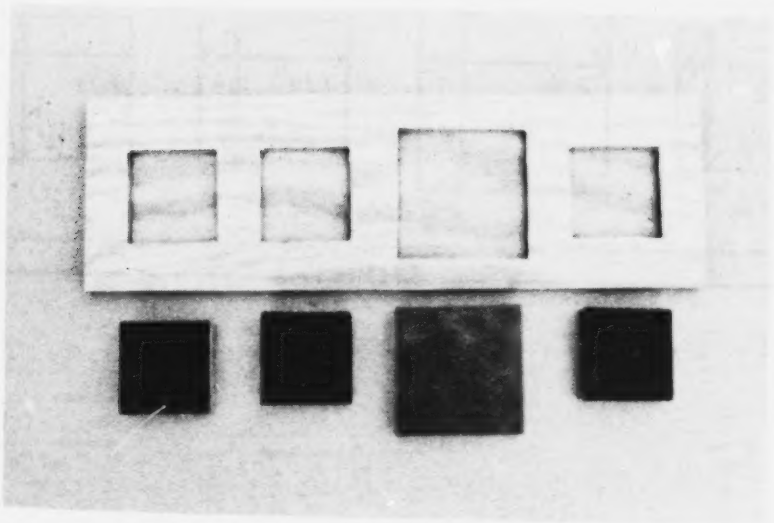
The factors of difference in this board are those of size and texture.

Behavioral Objective:

The child will demonstrate his recognition of difference in size and texture by selecting the square that is different, placing it in its proper cutout, and then placing the remaining like squares in their cutouts.

Procedure and Use:

The same procedure followed with Alike and Different Circles (page 33) is followed with this teaching aid.



Alike and Different Squares

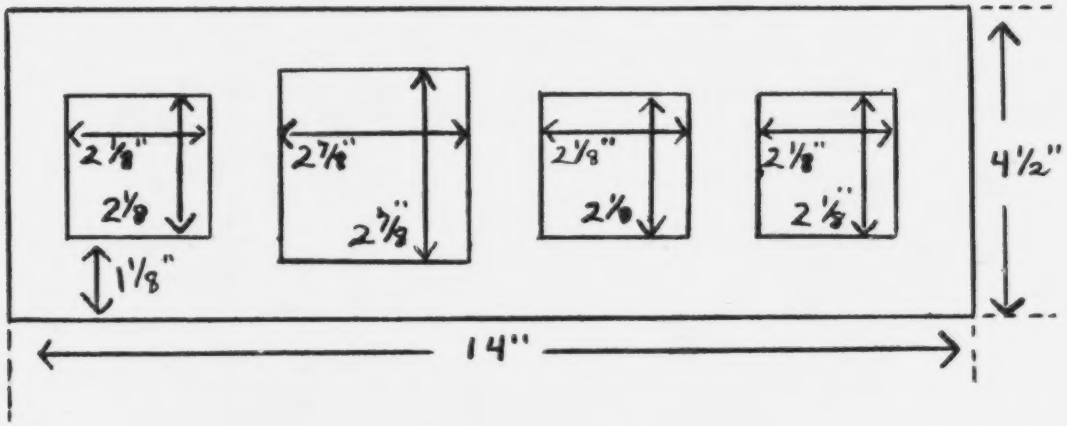
Step 1: From ⅝" plywood cut three blocks 2" × 2" and one block 2¾" × 2¾".

Step 2: Varnish the blocks cut in Step 1. On the three small blocks glue the same distinctive texture. On the large block glue a different distinctive texture. In the original, ridged rubber mat and smooth leather were used.

Step 3: Base: From ⅜" plywood cut a piece 4½" × 14".
From ¼" plywood cut a piece 4½" × 14".

Step 4: In the 4½" × 14" × ⅜" piece make three cutouts 2⅛" × 2⅛" and one cut-out 2⅞" × 2⅞" as shown in the diagram.

Step 5: Glue the two pieces of the base together.



BIG AND LITTLE CIRCLES AND SQUARES

Description:

The Big and Little Circle Board (page 22) and the Big and Little Square Board (page 41) are combined in a wooden tray.

Purpose:

The two familiar shapes in two sizes are combined with three sets of blocks to be used individually or in combination.

Behavioral Objective:

The child will demonstrate his recognition of two sizes of textured circles and squares by placing them in appropriate cutouts upon direction.

Procedure and Use:

The Big and Little Circle Board and Big and Little Square Board are reviewed individually. Then they are combined in the tray and the child is asked to find designated sizes and shapes using the wooden set of blocks.

With the foam rubber blocks and the combined boards in the tray, again the child is asked to indicate designated shapes and sizes. The process is repeated, using the textured set of blocks.

Finally, using all three sets of blocks, the child is asked to place designated sizes, shapes, and textures.

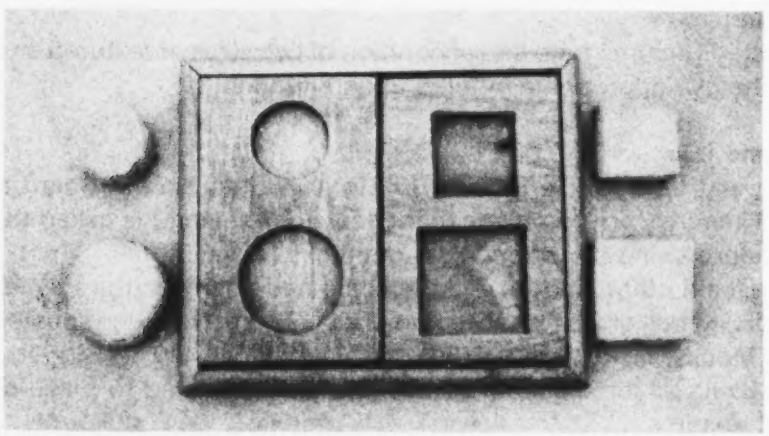
The added concept of position (left, right, top, bottom) can be reenforced by changing the board placement in the tray.

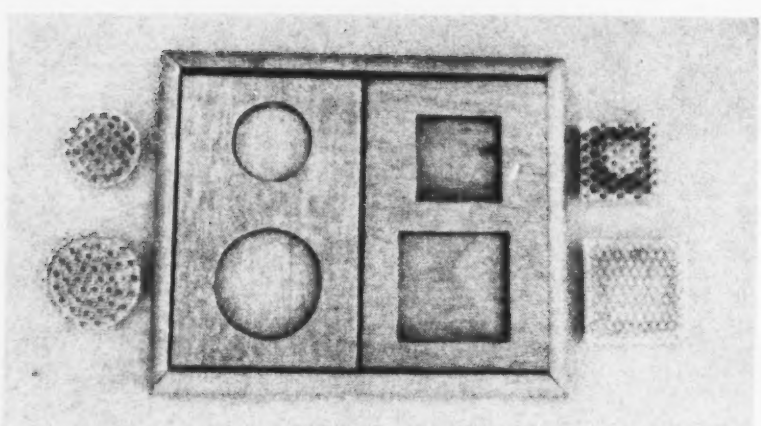
Tray for Big and Little
Circles and Squares

Step 1: From ⅜" (or ¼") wood cut a piece 7½" × 9¼".

Step 2: From ½" quarter round cut two pieces 9¼" long and two pieces 7½" long.

Step 3: Frame the tray, mitering the corners and nailing into place.





ALIKE AND DIFFERENT SHAPES I

Description:

This board has one row of three blocks. The different (circle) block is painted a contrasting color from the two square blocks.

Purpose:

The factor of difference in this board is that of shape with color as an additional clue.

Behavioral Objective:

The child will demonstrate his recognition of the difference in shape by selecting the block that is different, identifying all the shapes by name, and placing all of the blocks in their appropriate cutouts without assistance.

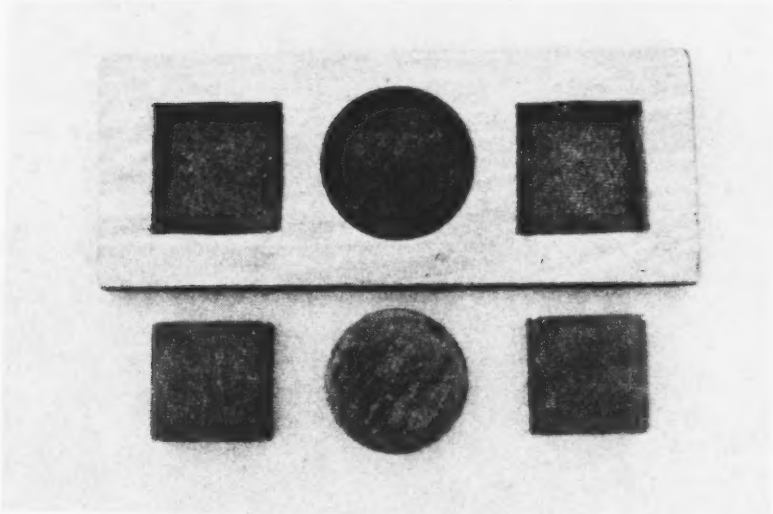
Procedure and Use:

The child examines the blocks in the board and identifies the shapes. He is asked to find the circle, remove it, and examine it in his hands. He does the same thing with the squares, comparing them as he examines them. The teacher explains that since there is only one circle, it is **different** from the others and that the squares are all **alike** because they are the same shape.

After replacing the blocks in the board, the teacher asks the child to find the one that is different in the board and the ones that are alike in the board. When he removes the pieces he is asked to identify the alike and different blocks outside the board.

The child replaces the blocks in their correct places in the board, randomly, and then following directions.

This concept is re-enforced through games, raised pictures, sorting, and classification.



Alike and Different Shapes I

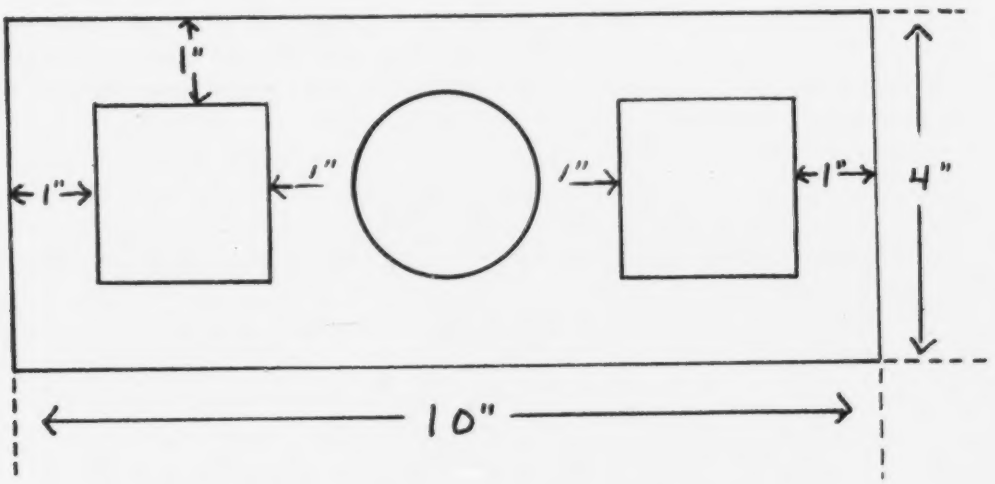
Step 1: From ¾" plywood cut two square blocks 1⅞" × 1⅞", and one circular block with a 2" diameter.

Step 2: Base: From ¼" plywood cut a piece 4" × 10".
From ⅜" plywood cut a piece 4" × 10".

Step 3: In the ⅜" × 4" × 10" piece make two 2" × 2" cutouts and a circular cutout 2⅛" in diameter as shown in the diagram.

Step 4: Glue the two pieces of the base together.

Step 5: Paint the two square blocks green and the circular block red.



FRAME - A - TRIANGLE

Description:

Three mitered wooden strips fit into a grooved base to form a triangle.

Purpose:

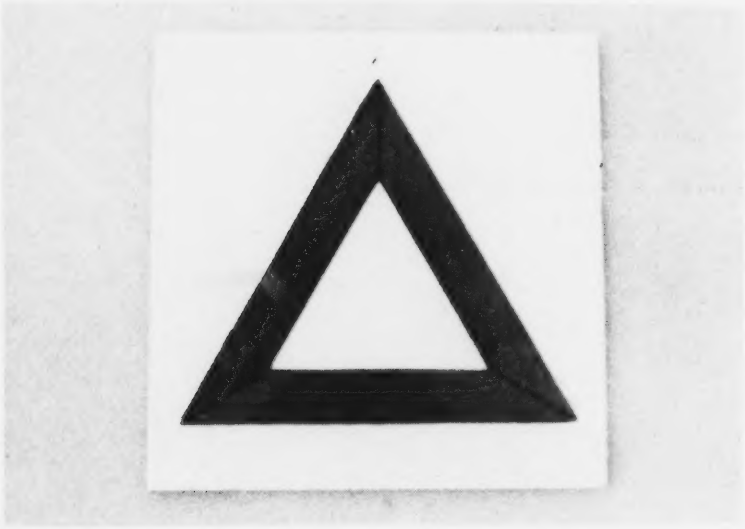
The three solid segments of the triangle allow the child to explore the straight sides and three points and to build a large triangle of his own.

Behavioral Objective:

The child will explore tactually the triangular frame, remove the pieces, examine the cutout track, and replace the three pieces in the groove.

Procedure and Use:

The board is presented to the child with the triangular frame in place. Starting at the top point he runs his fingers along the three sides to identify the shape. After removing the three sections, he examines the groove in the board and replaces the sections of the frame. Although the three sides are the same length and can be placed with either side up, the long edge must be toward the outside of the groove in order to have the corners fit correctly.



Frame-A-Triangle

Step 1: From ¾" wood cut three pieces 1¼" wide and 10" long.

Step 2: Miter the ends of the three strips at 30° angles to fit together into an equilateral triangle.

Step 3: Base: From ⅜" plywood cut a piece 12" × 12".
From ¼" plywood cut a piece 12" × 12".

Step 4: In the 12" × 12" × ⅜" piece make a triangular cut-out with 10¼" sides as shown in the diagram.

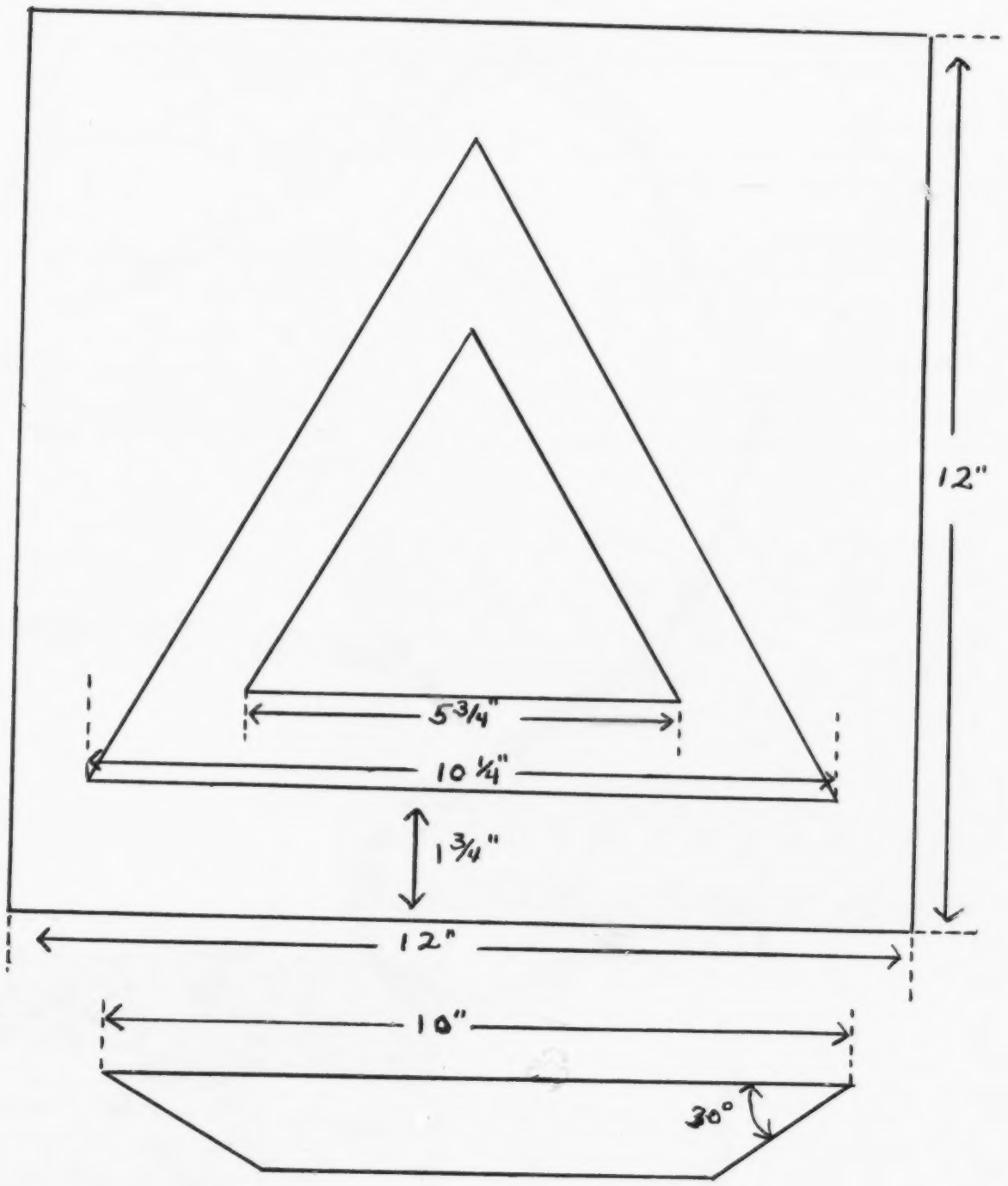
Step 5: Glue the two sections of the base together.

Step 6: From the triangular center section left after making the triangular cut-out in Step 4, cut an equilateral triangle with 5¾" sides.

Step 7: Glue and nail the triangle cut in Step 6 in the center of the triangular cut-out of the base, leaving a triangular track in which the three sections of the frame cut in Steps 1 and 2 fit easily.

Step 8: Paint the base yellow. Paint the three sections of the frame black.

Frame-A-Triangle



PEG - A - TRIANGLE

Description:

The twenty-four holes in this pegboard form a triangle. Dowel pegs are used.

Purpose:

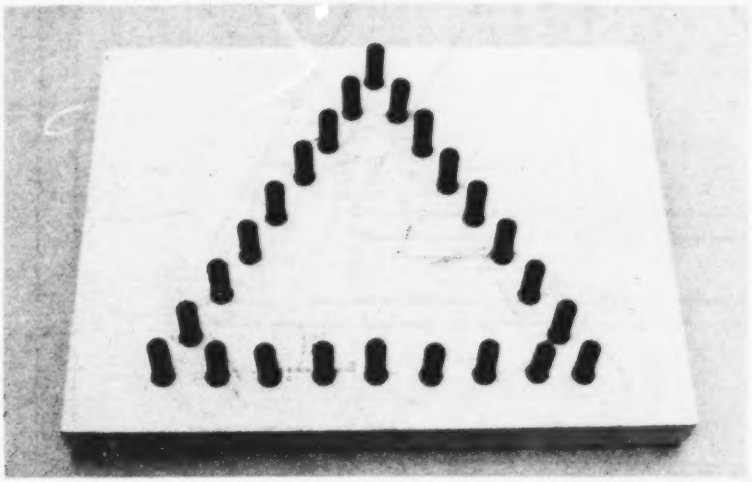
The broken outline of the triangle is more difficult to "see" as a triangle than the solid outline of Frame-A-Triangle.

Behavioral Objective:

The child will be able to remove all the pegs, replace them consecutively in straight lines from the top point down the right side, across the bottom and up the left side.

Procedure and Use:

After examination of the pegboard with the pegs still in place, the child traces the three sides of the triangle with his finger, locating the three points. Then he removes and replaces the pegs at random until he understands the peg hole pattern. Starting at the top point, he replaces the pegs one by one in sequential order.



Peg-A-Triangle

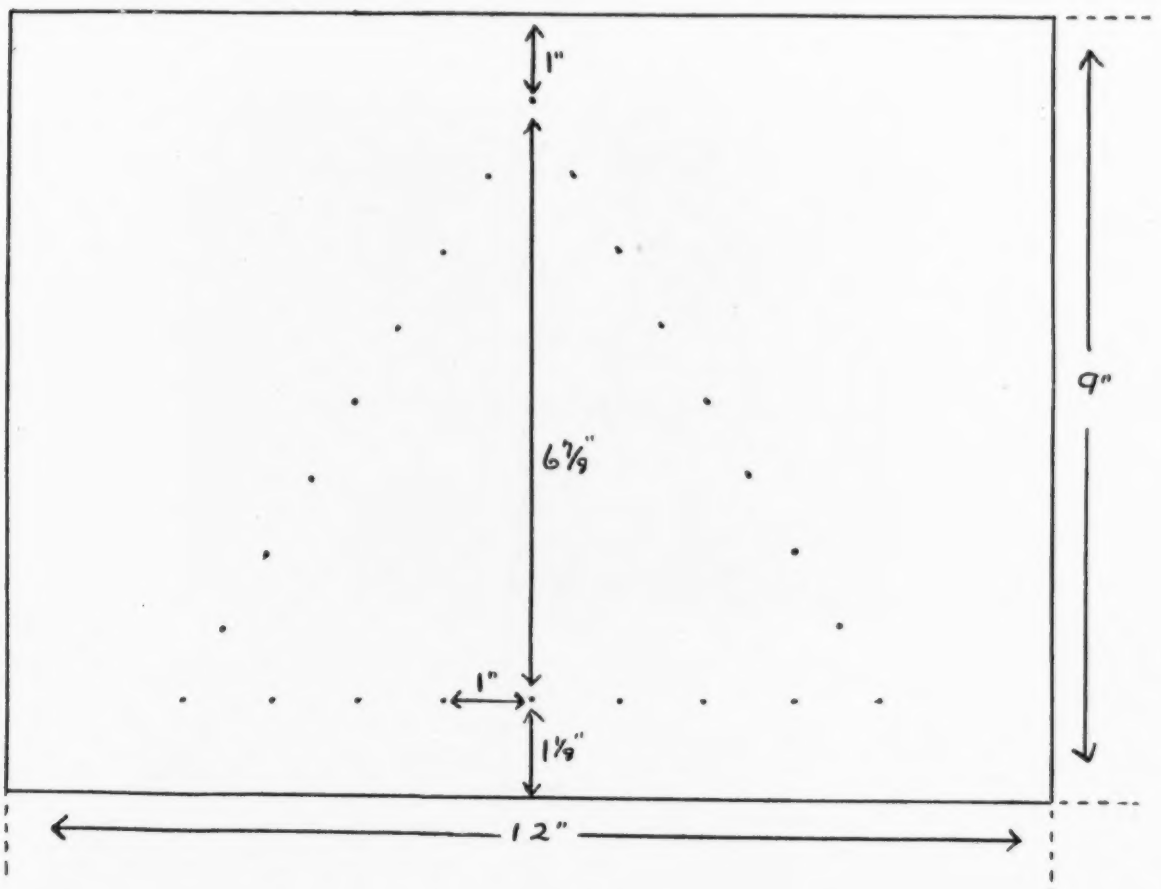
Step 1: From ⅜" dowels cut 24 pegs 1½" high.

Step 2: Base: From ¾" plywood cut a piece 9" × 12".
From ¼" plywood cut a piece 9" × 12".

Step 3: In the 9" × 12" × ¾" board make 24 holes with a 7/16" diameter at 1" intervals as shown in the diagram.

Step 4: Glue the two sections of the base together.

Step 5: Paint the base a bright color; stain the pegs.



BIG AND LITTLE TRIANGLES

Description:

Triangular blocks of two sizes are fitted into cutouts.

Purpose:

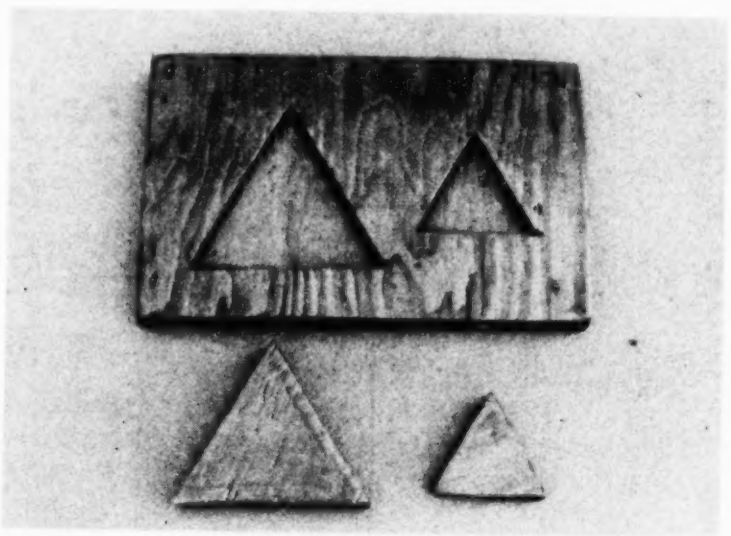
The board introduces the concept of size difference to a third shape.

Behavioral Objective:

The child will demonstrate his recognition of the difference in size by removing the big and little triangles and replacing them in the appropriate cutouts without assistance.

Procedure and Use:

The same procedure followed with Big and Little Circles (page 22) is followed with this teaching aid, including re-enforcement.



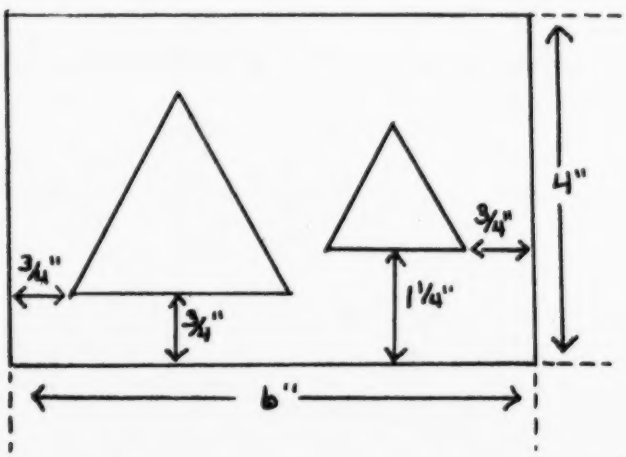
Big and Little Triangles

Step 1: From ⅝" plywood cut one equilateral triangle with 2½" sides and one equilateral triangle with 1½" sides.

Step 2: Base: From ¼" plywood cut a piece 4" × 6".
From ⅜" plywood cut a piece 4" × 6".

Step 3: In the ⅜" × 4" × 6" piece make two triangular cutouts as shown in the diagram.

Step 4: Glue the two pieces of the base together.



SMALL, MEDIUM, AND LARGE TRIANGLES

Description:

Wooden triangular blocks of three sizes are fitted into cutouts.

Purpose:

The concept of medium size is extended to a third basic shape.

Behavioral Objective:

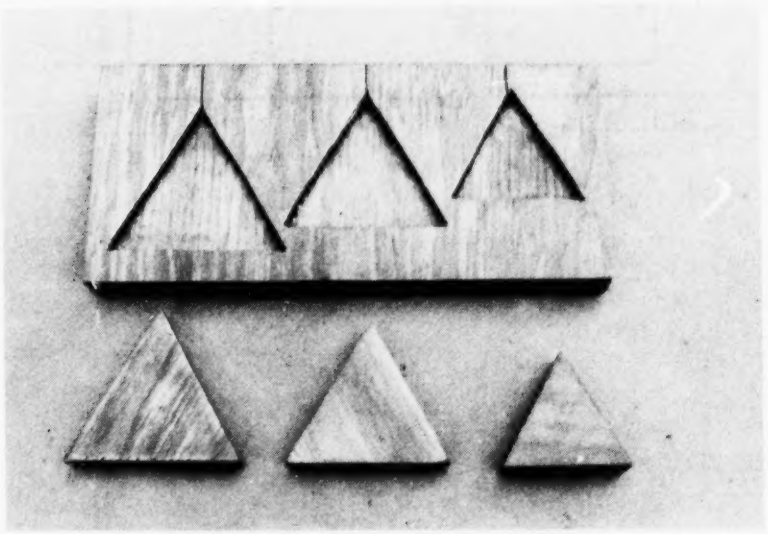
The child will be able to remove the triangular blocks and demonstrate recognition of the three different sizes by identifying the sizes by name and replacing them in their proper cutouts in any prescribed order such as large to small, etc. as directed.

Procedure and Use:

The same procedure followed for Small, Medium, and Large Circles I (page 24) is followed with this teaching aid.

Other Materials:

Similar commercial form boards available in textured rubber.



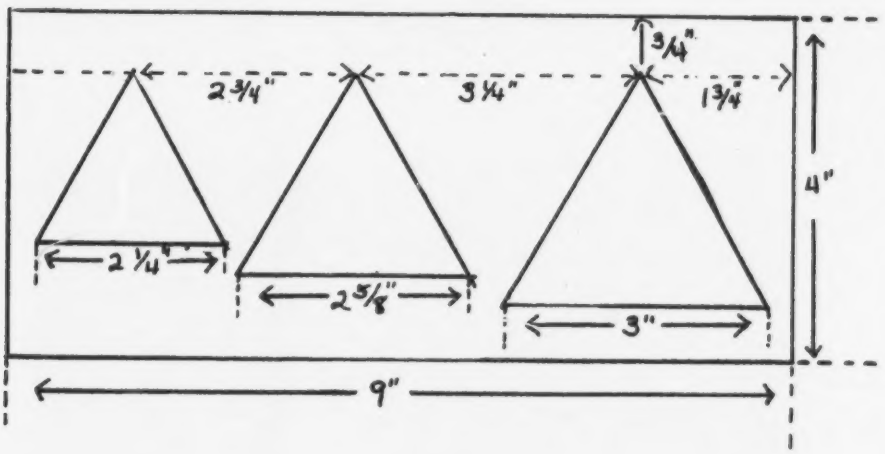
Small, Medium, and Large Triangles

Step 1: From ⅝" plywood cut equilateral triangles with sides the following lengths: 3", 2⅝", and 2¼".

Step 2: Base: From ¼" plywood cut a piece 9" × 4".
From ⅜" plywood cut a piece 9" × 4".

Step 3: In the ⅜" × 9" × 4" piece make three cutouts slightly larger in each dimension than the blocks cut in Step 1. See diagram for positions.

Step 4: Glue the two pieces of the base together.



ALIKE AND DIFFERENT TRIANGLES

Description:

This board has one row of four triangular blocks. The different block is larger.

Purpose:

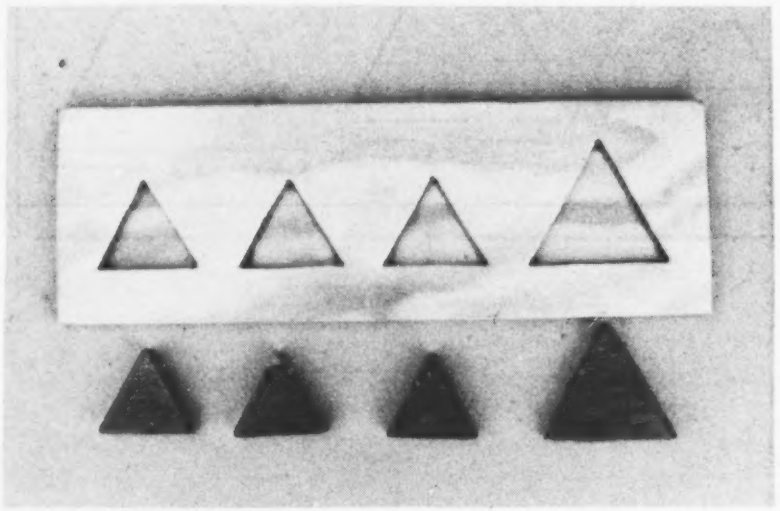
The factor of difference in this board is of size only.

Behavioral Objective:

The child will demonstrate his recognition of the difference in size by selecting the triangle that is different, placing it in its proper cutout, and then replacing like size triangles in their cutouts.

Procedure and Use:

The same procedure followed with Alike and Different Circles (page 33) is followed with this teaching aid.



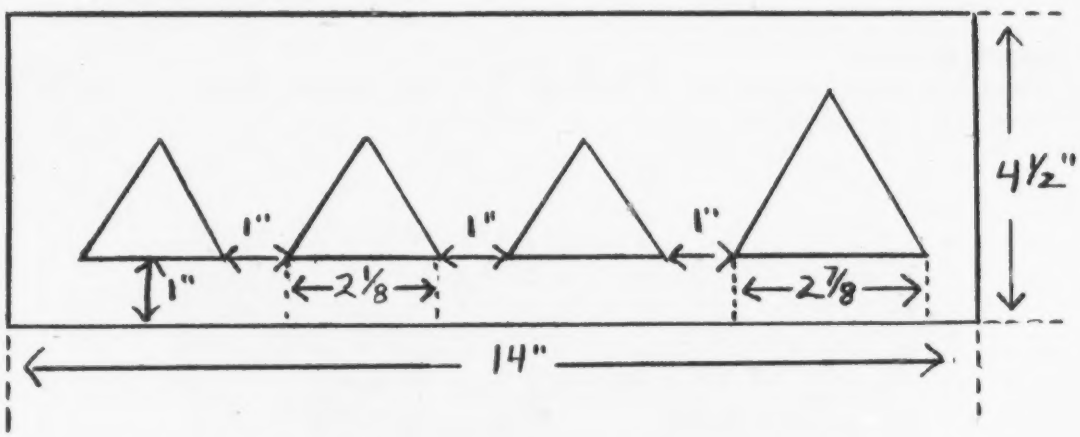
Alike and Different Triangles

Step 1: From ¾" plywood cut three equilateral triangular blocks with 2" sides and one equilateral triangular block with 2¾" sides.

Step 2: Base: From ⅜" plywood cut a piece 4½" × 14".
From ¼" plywood cut a piece 4½" × 14".

Step 3: In the 4½" × 14" × ⅜" piece make four cutouts as shown in the diagram.

Step 4: Glue the two pieces of the base together.



ALIKE AND DIFFERENT SHAPES II

Description:

This board has one row of three blocks. The different (square) block is painted a contrasting color from the two triangular blocks.

Purpose:

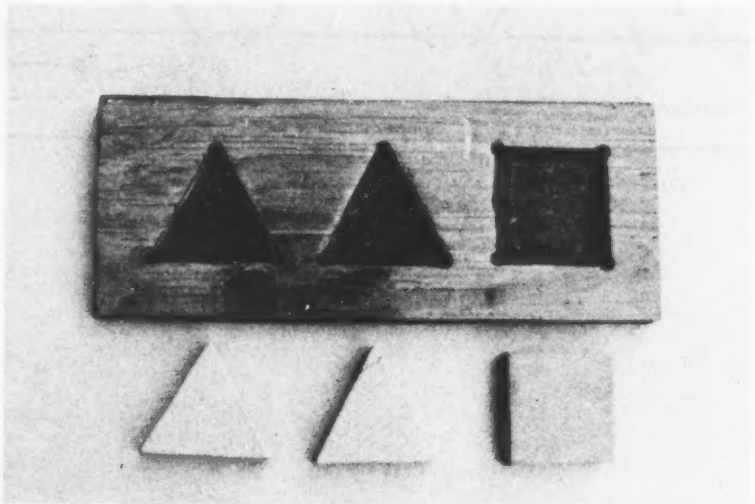
The factor of difference in this board is shape, with color as an additional clue.

Behavioral Objective:

The child will demonstrate his recognition of the difference in shape by selecting the block that is different, identifying all shapes by name, and placing all of the blocks in their appropriate cutouts without assistance.

Procedure and Use:

The same procedure followed in Alike and Different Shapes I (page 51) may be followed with this teaching aid.



Alike and Different Shapes II

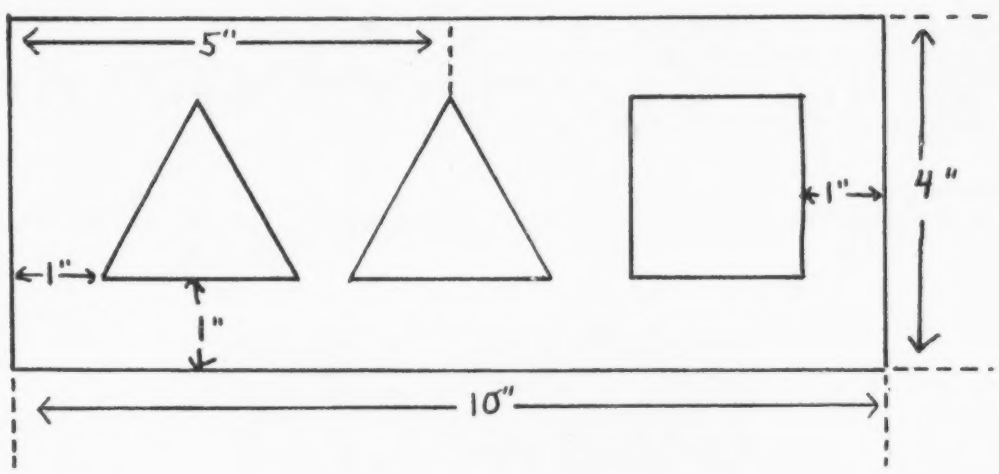
Step 1: From ¾" plywood cut two equilateral triangles with 2" sides and one square 1⅞" × 1⅞".

Step 2: Base: From ¼" plywood cut a piece 4" × 10".
From ⅜" plywood cut a piece 4" × 10".

Step 3: In the ⅜" × 4" × 10" piece make two triangular cutouts with 2¼" sides and a 2" × 2" cutout as shown.

Step 4: Glue the two sections of the base together.

Step 5: Paint the two triangular blocks blue and the square block orange.



BASIC SHAPE BOARD

Description:

Three wooden blocks in the shape of a triangle, a circle, and a square are fitted into cutouts.

Purpose:

The board is for differentiation between the three basic shapes.

Behavioral Objective:

The child will demonstrate his recognition of the three basic shapes by naming each shape as he places it in the appropriate space without assistance.

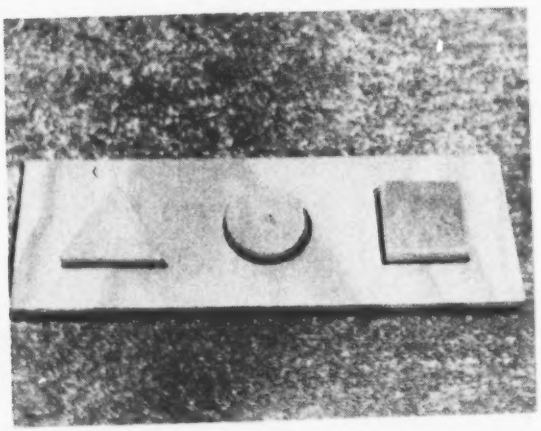
Procedure and Use:

The child first identifies the shape of each block in the cutout board. Then he removes each one and examines the board without the blocks, describing the shapes of the cutouts. He replaces the pieces first at random, then following directions, and finally in left to right order, identifying each one.

As each shape is learned, the child makes a raised textured picture to take home. High raised pictures are reduced to thin felt ones.

Other Materials:

Form boards are commercially available, usually with four shapes instead of three.



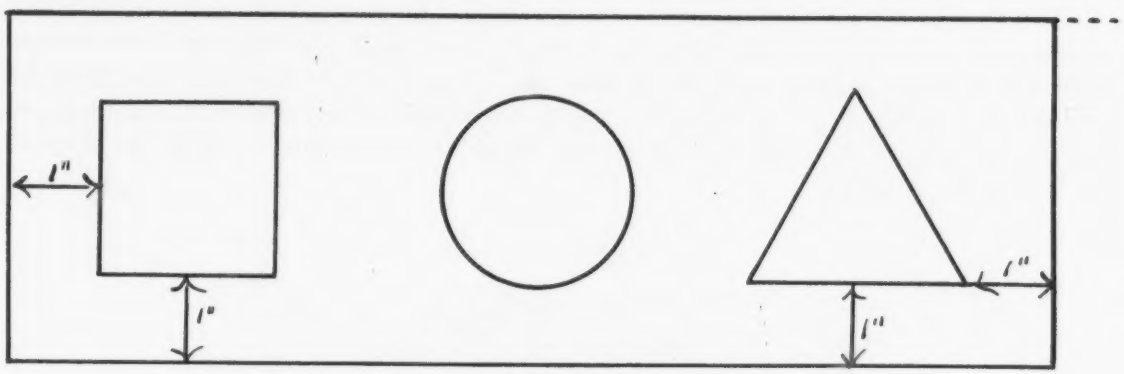
Basic Shape Board

Step 1: From ¾" plywood cut blocks the following sizes: square 2" × 2", circle with 2" diameter, equilateral triangle with 2⅜" sides.

Step 2: Base: From ⅜" plywood cut a piece 4" × 12".
From ¼" plywood cut a piece 4" × 12".

Step 3: In the 4" × 12" × ⅜" board make cut-outs for the square, circle, and triangle as shown. The cut-outs should be slightly larger than the blocks to allow easy placement.

Step 4: Glue the two sections of the base together.



BIG AND LITTLE BASIC SHAPES

Description:

Two sizes of circular, square and triangular blocks are fitted into two vertical rows of cutouts, the large blocks in one row and the small blocks in another.

Purpose:

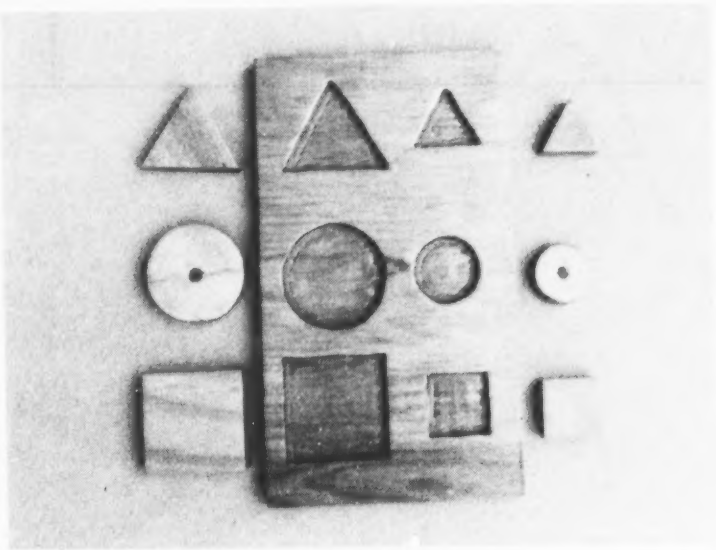
The concept of size discrimination is combined with that of differentiation of the three basic shapes.

Behavioral Objective:

The child will be able to name each basic shape, identifying it as large or small, and place it in the appropriate cutout as instructed.

Procedure and Use:

The board with two sizes of each of the three basic shapes is given to the child to examine and explain both shapes and sizes. First, he removes just the two circle blocks, examines the cutouts, and replaces the blocks. The same procedure would be followed with the two square blocks and the two triangular blocks. Then all blocks would be removed, the cutouts examined and the blocks replaced, first at random, and then according to specific directions.



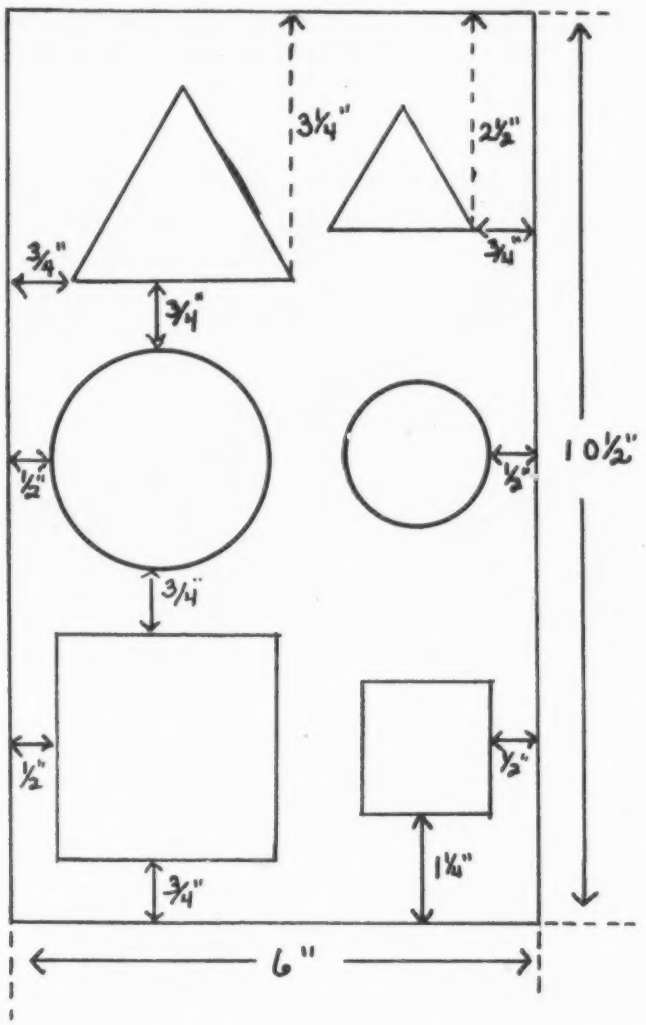
Big and Little Basic Shapes

Step 1: From ⅝" plywood cut blocks the following sizes: 2½" × 2½"; 1½" × 1½"; circle with 2½" diameter, circle with 1½" diameter; equilateral triangle with 2½" sides; equilateral triangle with 1½" sides.

Step 2: Base: From ¼" plywood cut a piece 6" × 10½".
From ⅜" plywood cut a piece 6" × 10½".

Step 3: In the ⅜" × 6" × 10½" piece make cutouts slightly larger than the blocks cut in Step 1 as shown in the diagram.

Step 4: Glue the two pieces of the base together.



SMALL, MEDIUM, AND LARGE BASIC SHAPES

Description:

Three sizes of circular, square, and triangular blocks in horizontal rows are placed in cutouts.

Purpose:

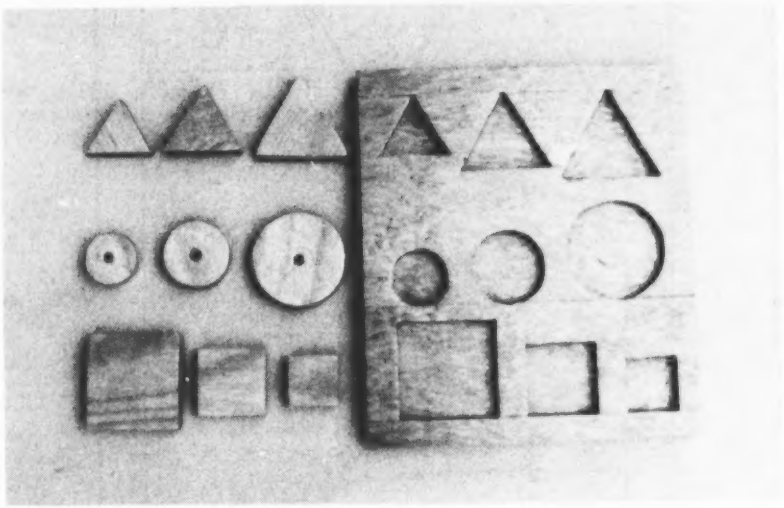
The concepts of three sizes and three different shapes are combined.

Behavioral Objective:

The child will be able to name each basic shape; identify it as small, medium or large; and place it in the appropriate cutout.

Procedure and Use:

The same procedure followed with Big and Little Basic Shapes (page 68) is followed with this teaching aid, adding only the medium size block in each shape.



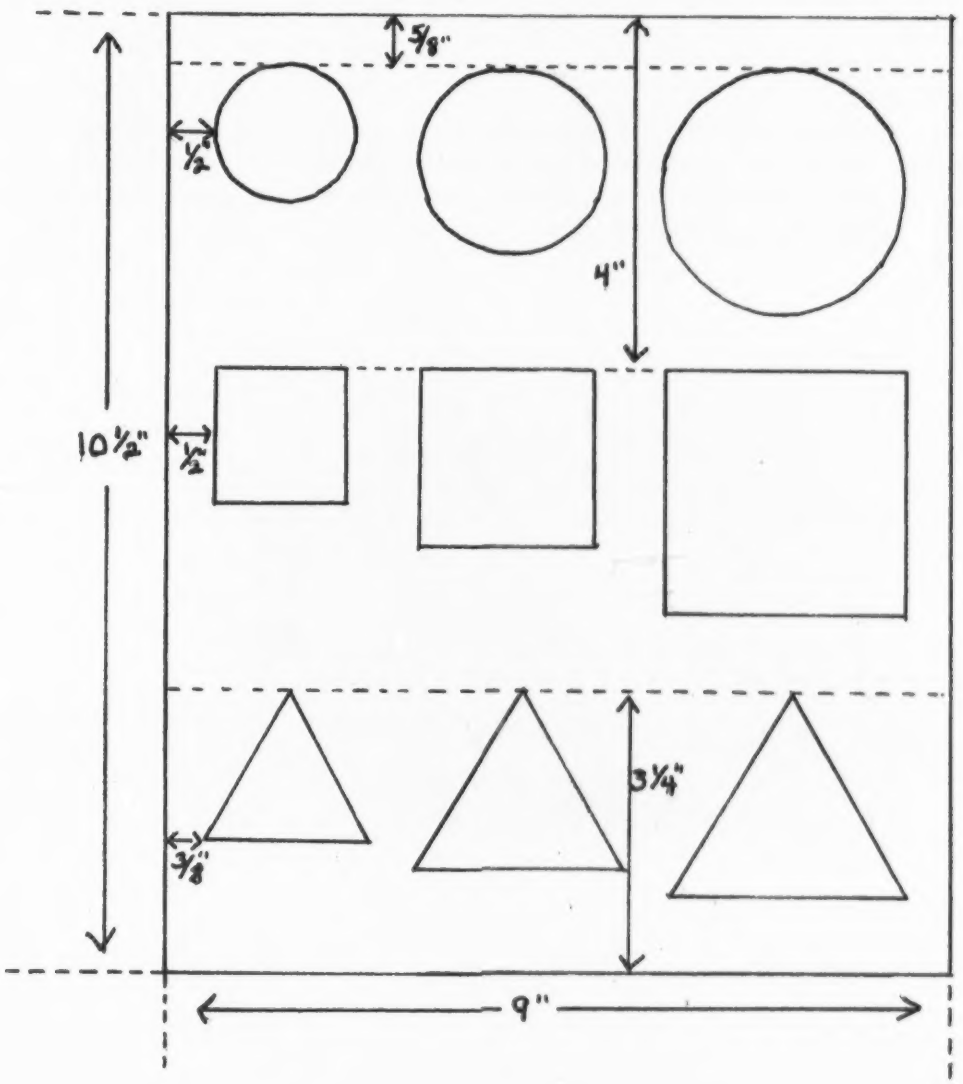
Small, Medium, and Large Basic Shapes

Step 1: From ⅝" plywood cut nine blocks the following dimensions: Squares 2¾" × 2¾"; 2" × 2"; and 1½" × 1½"; Circles with diameters of 2¾", 2", and 1½"; equilateral triangles with sides 2¾", 2⅜", 1⅞".

Step 2: Base: From ¼" plywood cut a piece 9" × 10½".
From ⅜" plywood cut a piece 9" × 10½".

Step 3: In the ⅜" × 9" × 10½" piece make nine cutouts as shown in the diagram.

Step 4: Glue the two pieces of the base together.



FRAME - A - RECTANGLE

Description:

Four mitered wooden strips, two long and two short, fit into a grooved base to form a rectangle.

Purpose:

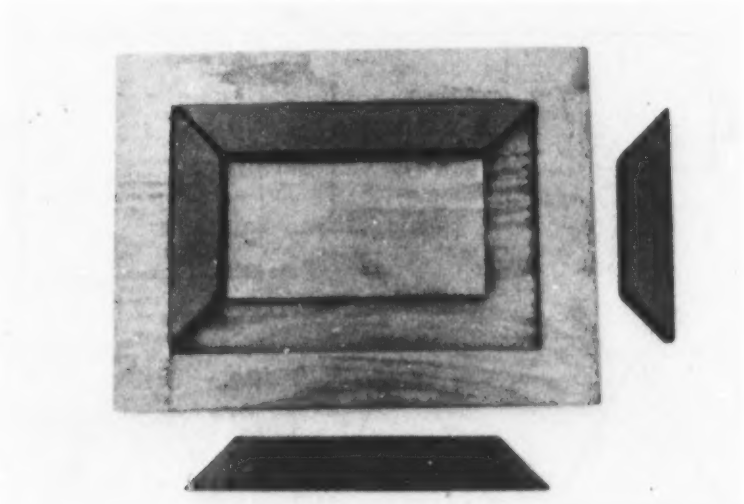
The four raised segments of the rectangle provide opportunity for the exploration of the relationship of long and short straight sides and for the arrangement of the segments to form a rectangle.

Behavioral Objective:

The child will explore tactually the rectangular frame, remove the pieces, examine the cutout track, and replace the four sections in the correct grooves according to directions.

Procedure and Use:

The same procedure followed with Frame-A-Square (page 36) is followed with this teaching aid. In addition, the difference in the lengths of the sides is stressed in the tactual examination of both the frame in the board and the groove itself. Comparison of the long and short side sections should be made.



Frame-A-Rectangle

Step 1: From ¾" wood cut two pieces 1¼" wide and 5¾" long, and two pieces 1¼" wide and 8⅞" long.

Step 2: Miter the ends of the four strips at 45° angles to form the four sides of a rectangular frame.

Step 3: Base: From ⅜" plywood cut a piece 9" × 12".
From ¼" plywood cut a piece 9" × 12".

Step 4: In the 9" × 12" × ⅜" piece make a rectangular cut-out 9⅛" × 6⅛" as shown in the diagram.

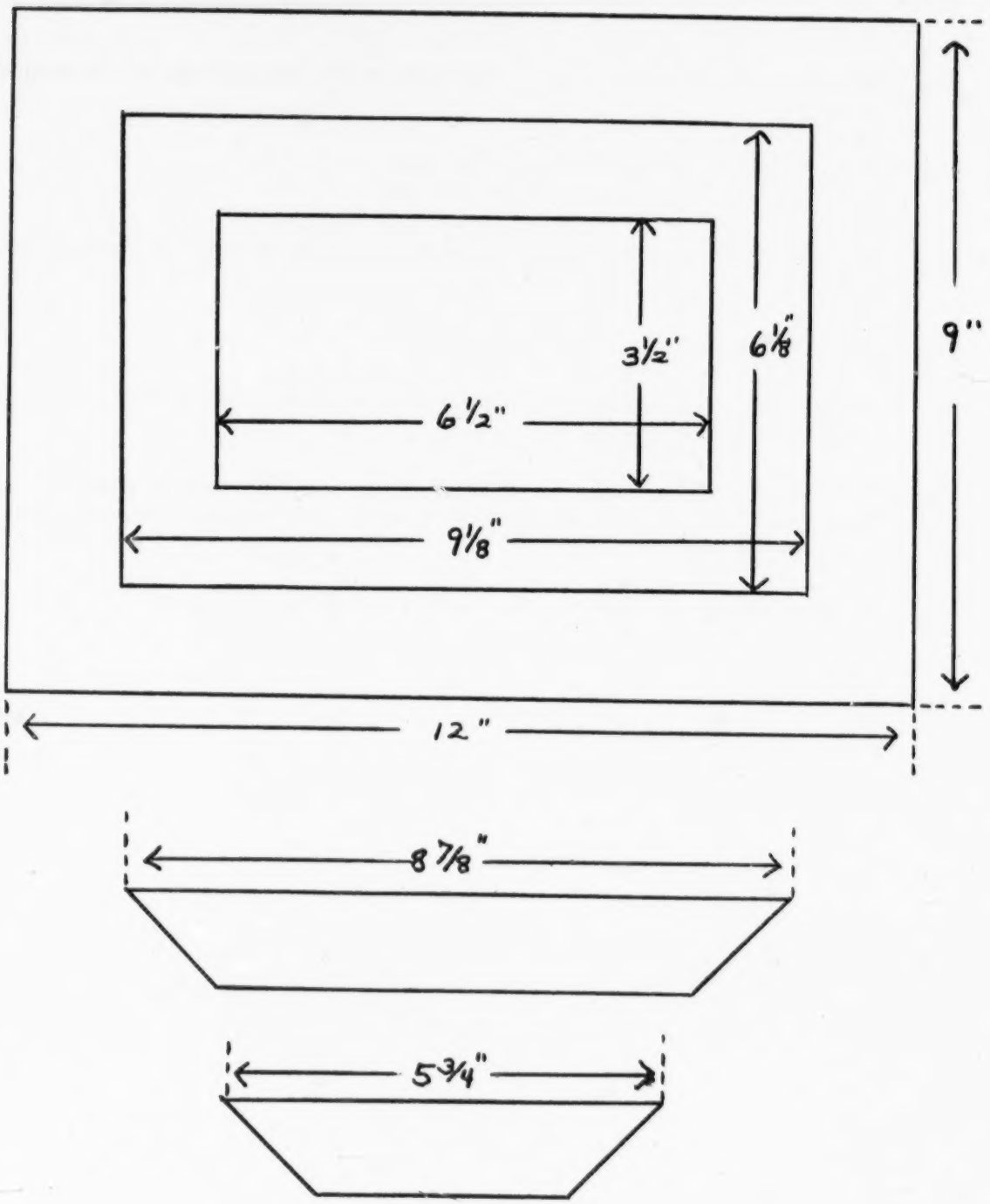
Step 5: Glue the two sections of the base together.

Step 6: From the rectangular center section left after making the rectangular cut-out in Step 4, cut a rectangle 3½" × 6½".

Step 7: Glue and nail the rectangle cut in Step 6 in the center of the rectangular cut-out of the base, leaving a rectangular track in which the four sections of the frame cut in Steps 1 and 2 fit easily.

Step 8: Paint the base green. Paint the four sections of the frame black.

Frame-A-Rectangle



PEG-A-RECTANGLE

Description:

The thirty holes in this pegboard form a rectangle. Dowel pegs are used.

Purpose:

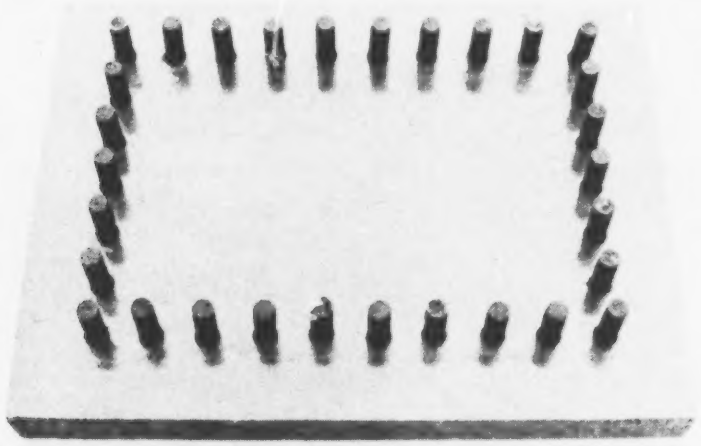
The broken outline of the rectangle is more difficult to discriminate than the solid outline of the frame.

Behavioral Objective:

The child will tactually explore the long and short sides of the rectangle, remove the pegs, and be able to replace the pegs consecutively, starting at the top left corner, across the top, down the right side, across the bottom, and up the left side.

Procedure and Use:

The same procedure followed with Peg-A-Square (page 39) is followed with this aid. The difference in the length of the sides will become clearer to the child if he actually counts the number of equally spaced pegs on each side.



Peg-A-Rectangle

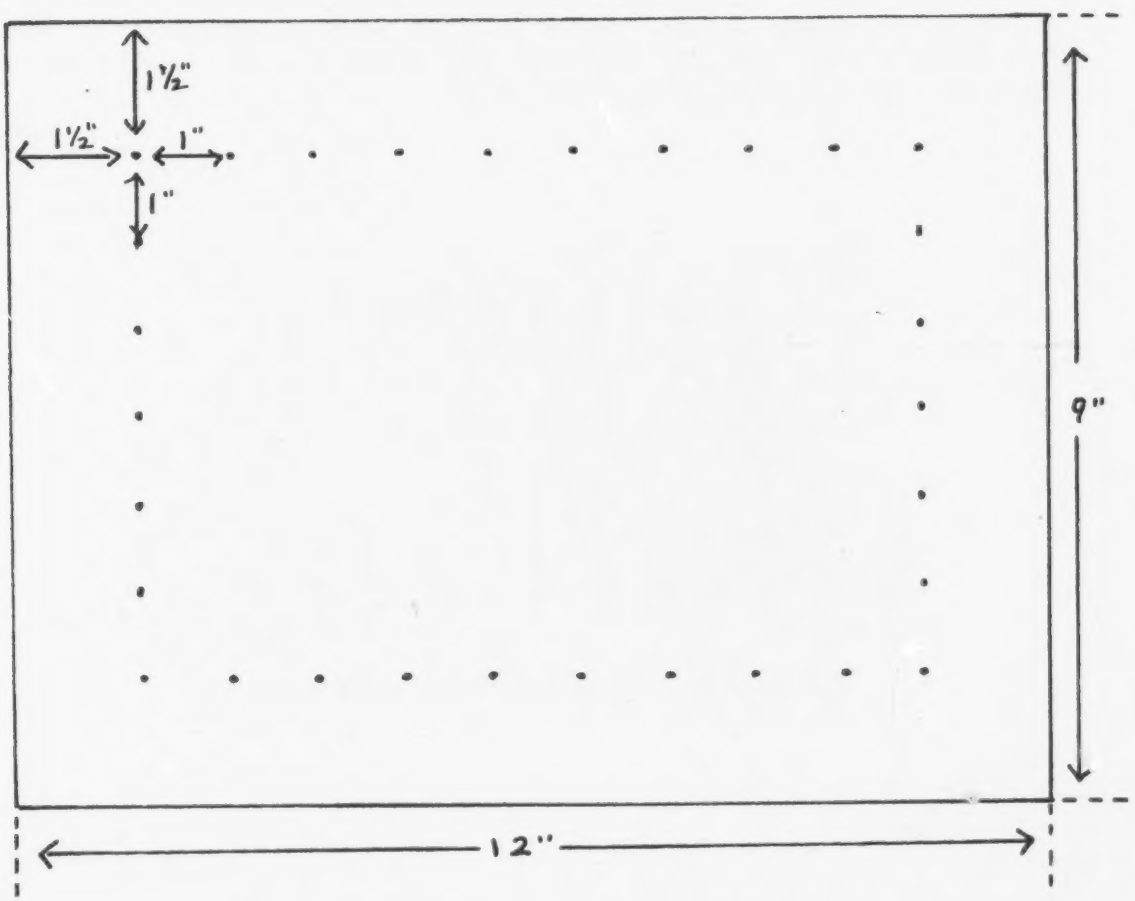
Step 1: From ⅜" dowels cut 30 pegs 1½" high.

Step 2: Base: From ¾" plywood cut a piece 9" × 12".
From ¼" plywood cut a piece 9" × 12".

Step 3: In the 9" × 12" × ¾" piece make 30 holes with a 7/16" diameter at 1" intervals as shown in the diagram.

Step 4: Glue the two sections of the base together.

Step 5: Paint the base a bright color; stain the pegs.



PEG - A - SHAPE

Description:

Overlapping outlines of a rectangle, triangle, square, and circle are formed with short dowel pegs on a large pegboard.

Purpose:

This pegboard tests tactual form constancy and understanding of overlapping forms.

Behavioral Objective:

A. After tactually exploring and tracing with his fingers around the outlines of the four basic shapes, the child will be able to identify each by name.

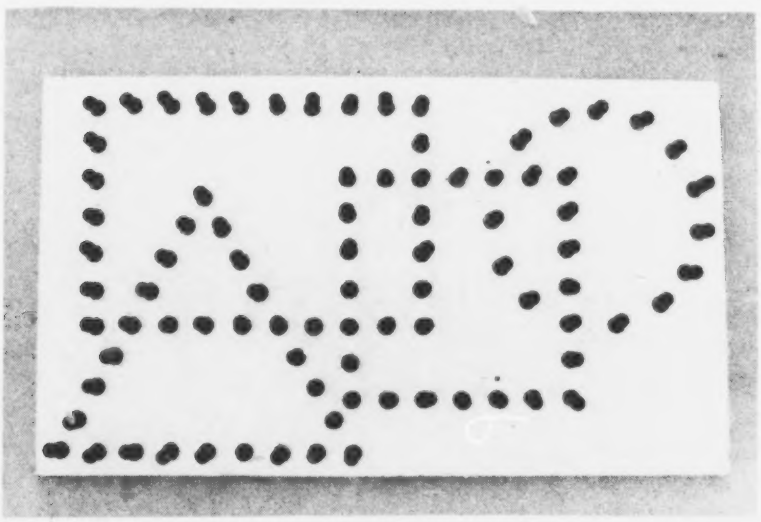
B. After removing the pegs, the child will be able to arrange the pegs in sequence to make each shape separately and then overlapping as directed.

Procedure and Use:

Pegs forming the circle, square, triangle, and rectangle are put into the base, one shape at a time, for the child to trace with his finger and identify. He can probably do this independently since he has had each shape pegged on an individual board. Then with **all** of the pegs in the board he traces each of the shapes with assistance.

With the teacher's help, the child removes the pegs, one shape at a time. Then he replaces the pegs in the board, one shape at a time, until all the pegs are again in the board.

Eventually, the child may be able to remove all of the pegs, one figure at a time, and replace them in the board in the same manner. However, this is a difficult task and should be very closely supervised to see that the child does not become confused with the overlapping outlines.



Peg-A-Shape

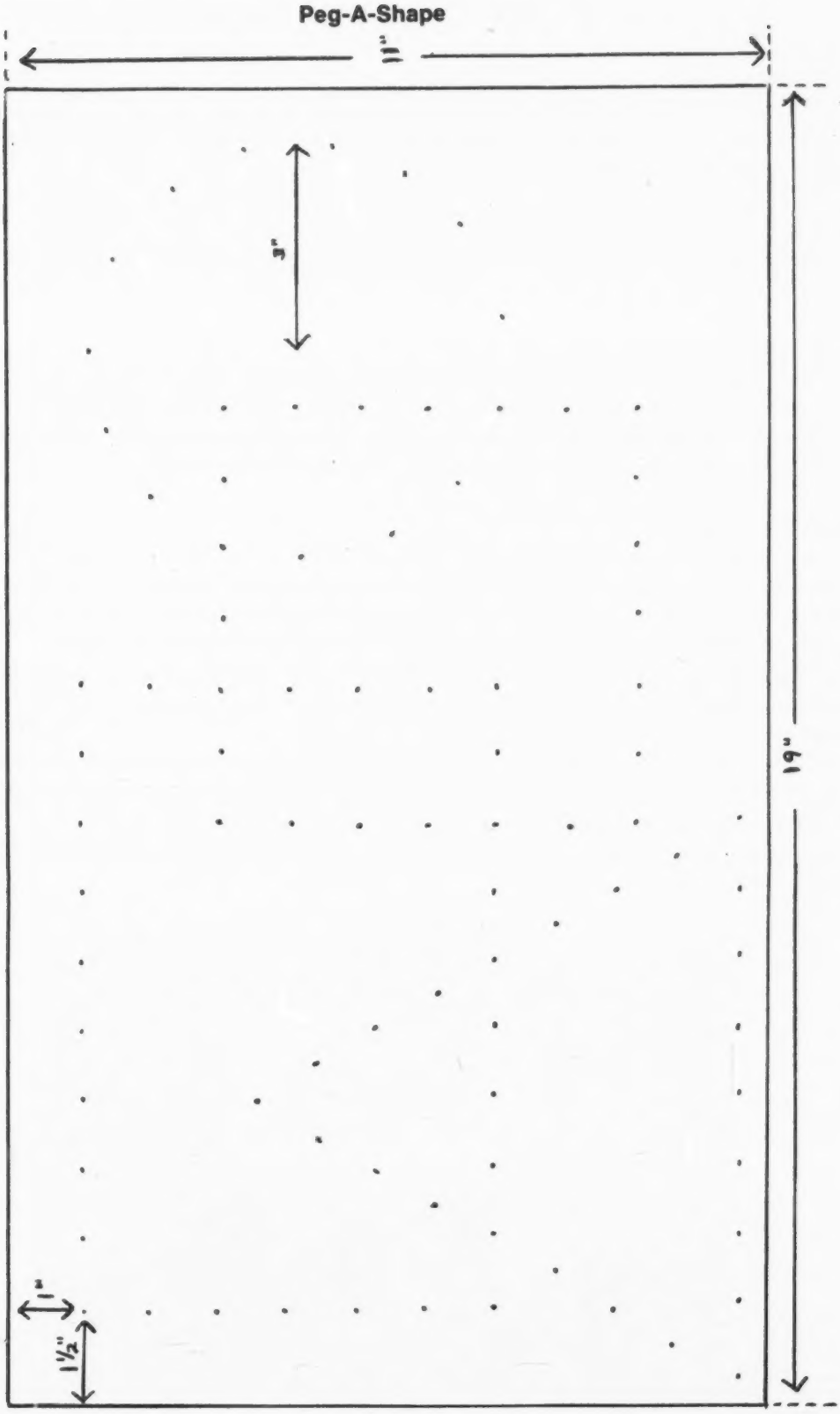
Step 1: From ⅜" dowels cut 87 pegs 1½" high.

Step 2: Base: From ¾" plywood cut a piece 11" × 19".
From ¼" plywood cut a piece 11" × 19".

Step 3: In the 11" × 19" × ¾" board make holes with diameters of 7/16" as shown in the diagram. (Holes are at 1" intervals except in the circle where the holes are spaced at even intervals as shown.)

Step 4: Glue the two sections of the base together.

Step 5: Paint the base white; stain the pegs black.


Peg-A-Shape
3"
19"
1"
1½"

ALIKE AND DIFFERENT DIAMONDS

Description:

This board has one row of four diamond shaped blocks. All blocks are the same except that one is painted a contrasting color from the others. One of the cutouts is horizontal; three are vertical.

Purpose:

Using an unfamiliar shape the factor of difference is position in the board. Color is used as a clue.

Behavioral Objective:

The child will demonstrate his recognition of the difference in position by locating the diamond block that is positioned differently in the board, locating the differently positioned cutout after the blocks have been removed, placing one diamond in it, and then placing the other diamond blocks in the remaining cutouts.

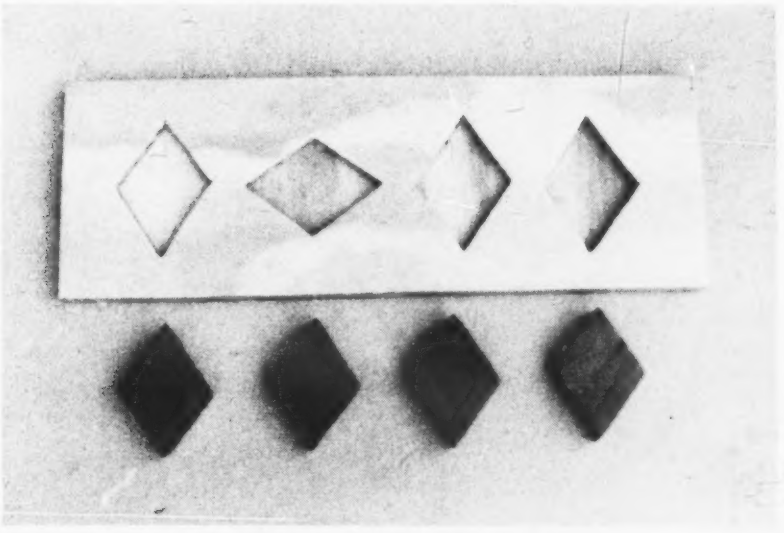
Procedure and Use:

The child examines the blocks in the board and is told what the new shape is. Then he is told that one of the shapes is different and is shown which one. It is explained to him that the "different" diamond is different because of position. Then he is shown that the other diamond blocks are alike because they are in the **same** position.

The child is asked to remove all of the blocks and examine the cutouts to find the one that is different (horizontal) and the ones that are the same (vertical). He may need to be shown this.

The child is then instructed to put a diamond block in the differently positioned cutout. (If he is able to use the color clue, he may select the diamond that is a different **color** as well). Then he places the other blocks in the alike (vertical) positions.

Finally, the child is asked to find the block that is different in the board and then the ones that are alike.



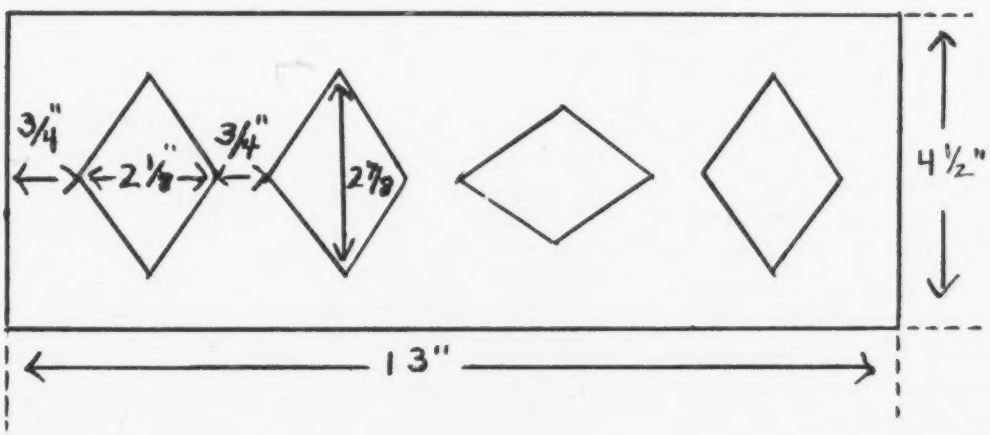
Alike and Different Diamonds

Step 1: From ¾" plywood cut four diamond-shaped blocks 2" × 2¾". Paint three of the blocks the same color and the fourth a contrasting color.

Step 2: Base: From ⅜" plywood cut a piece 4½" × 13".
From ¼" plywood cut a piece 4½" × 13".

Step 3: In the 4½" × 13" × ⅜" board make four cutouts as shown in the diagram.

Step 4: Glue the two pieces of the base together.



ALIKE AND DIFFERENT RECTANGLES

Description:

This board has one row of four rectangular blocks. All blocks are the same except that one has a different texture. One of the cutouts is horizontal; the other three are vertical.

Purpose:

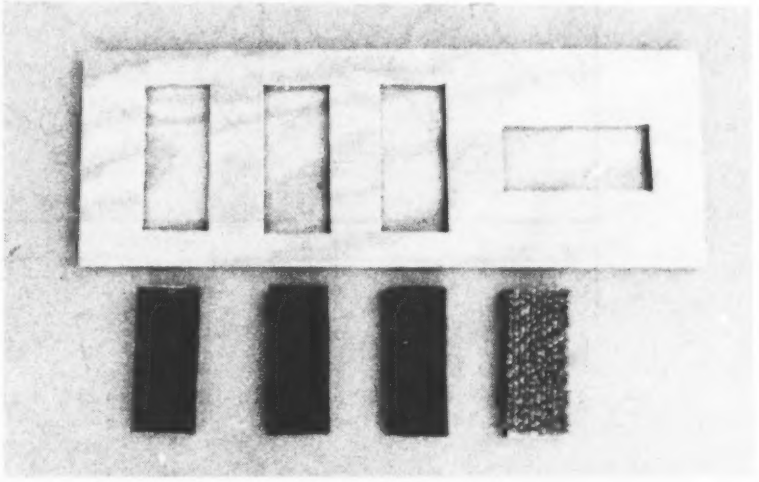
The factors of difference in this board are texture and position.

Behavioral Objective:

The child will demonstrate his recognition of difference in position and texture by selecting the rectangle that is different in texture, placing it in the cutout that is positioned differently, and then placing the three identically textured rectangles in their identically positioned cutouts according to instructions.

Procedure and Use:

The same procedure is followed as in Alike and Different Diamonds (page 80). However, a difference of texture is added to that of position, and the child should be able to identify this shape.



Alike and Different Rectangles

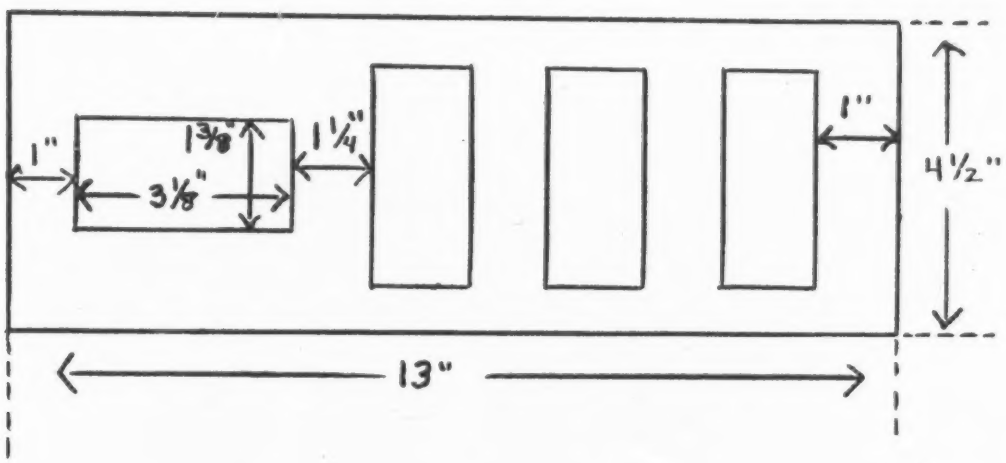
Step 1: From ½" plywood cut four blocks 1¼" × 3".

Step 2: Varnish the blocks cut in Step 1. On three of the blocks glue the same distinctive texture. On the fourth block glue a different distinctive texture. Smooth leather and carpeting were used in the original.

Step 3: From ¼" plywood cut two pieces 4½" × 13".

Step 4: In one of the pieces cut in Step 3 make four cutouts 1⅜" × 3⅛" as shown in the diagram.

Step 5: Glue the two pieces of the base together.



ALIKE AND DIFFERENT SHAPES III

Description:

This board has one row of four blocks. The different (rectangular) block is a different texture from the three circular blocks.

Purpose:

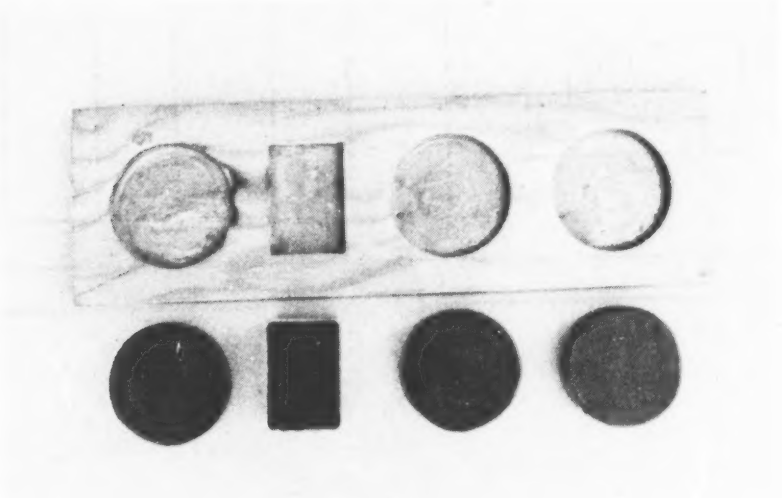
The factors of difference in this board are shape and texture, with an increased number of blocks.

Behavioral Objective:

The child will demonstrate his recognition of the difference in shape and texture by selecting the block that is different, identifying all shapes by name, and placing all of the blocks in their appropriate cutouts as directed.

Procedure and Use:

The same procedure followed in Alike and Different Shapes I (page 51) should be followed with this teaching aid. In addition, the child is asked to identify alike and different textures coordinated with the alike and different shapes.



Alike and Different Shapes III

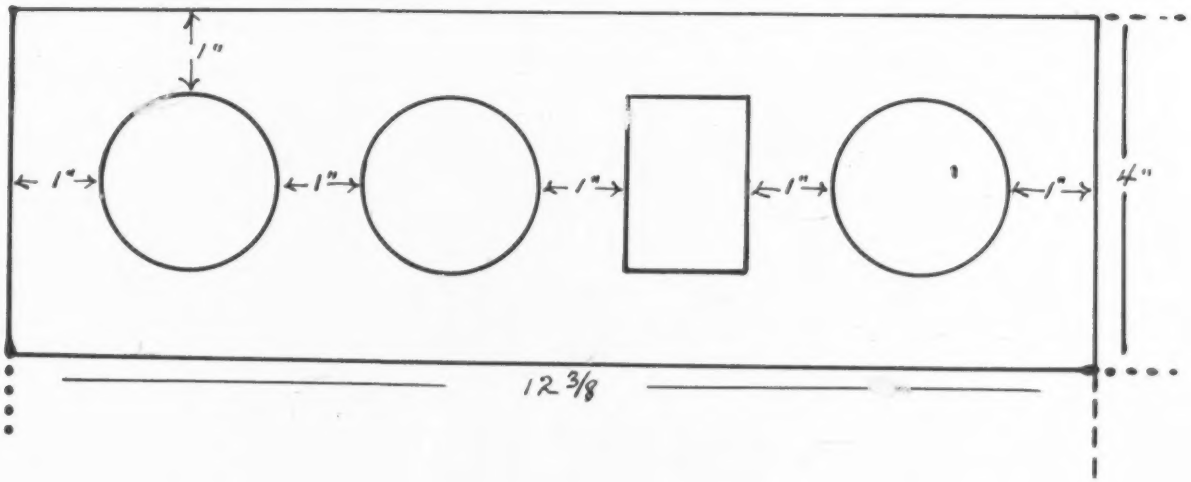
Step 1: From ¾" wood cut three circular blocks with a 2" diameter and a rectangular block 2" × 1⅜".

Step 2: Base: From ⅜" plywood cut a piece 4" × 12⅜".
From ¼" plywood cut a piece 4" × 12⅜".

Step 3: In the ⅜" × 4" × 12⅜" piece make three circular cutouts 2⅛" in diameter and a rectangular cutout 2⅛" × 1½" as shown.

Step 4: Glue the two sections of the base together.

Step 5: Glue smooth leather on the three circular blocks and rubber doormat on the rectangular block.



ALIKE AND DIFFERENT SHAPES IV

Description:

This board has two rows of three blocks each. The different block in each row is a different shape. Upholstery tacks divide the rows.

Purpose:

Doing a task with which he is familiar, the child is called upon to deal with four shapes at once and to discern two discrete rows.

Behavioral Objective:

The child will demonstrate his recognition of the different shape in each row by selecting the block that is different, identifying all shapes by name, and placing the blocks one row at a time as instructed.

Procedure and Use:

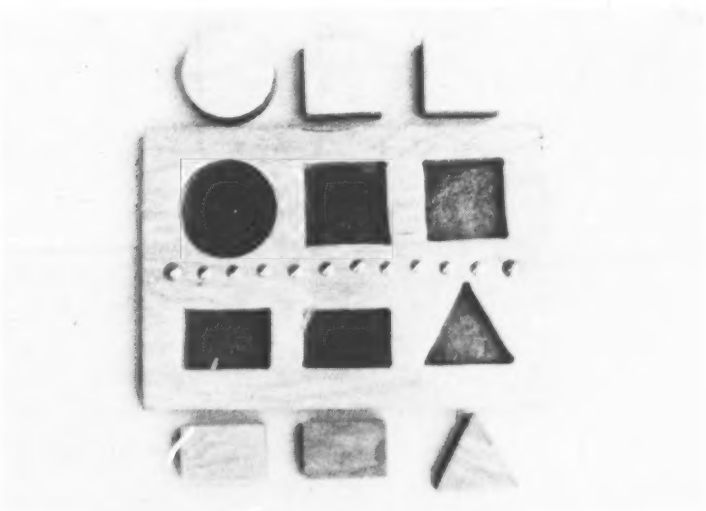
The child is asked to identify the shapes at the top of the board. (He is shown the top if necessary). After being shown the tacks which divide the top row from the bottom row, he is asked to identify the shapes at the bottom of the board. Again he is helped to locate the bottom row if necessary.

The child is instructed to identify the blocks on the top row, find and identify first the one that is different and then the ones that are alike. He follows the same procedure for the bottom row. If necessary, the rows are located for him.

Enrichment activities should again be stressed, incorporating this activity with the child's experiential world as much as possible.

Variation:

Boards with four blocks to a row or three rows could be used as a sequel to this aid. The factor of difference should remain constant.



Alike and Different Shapes IV

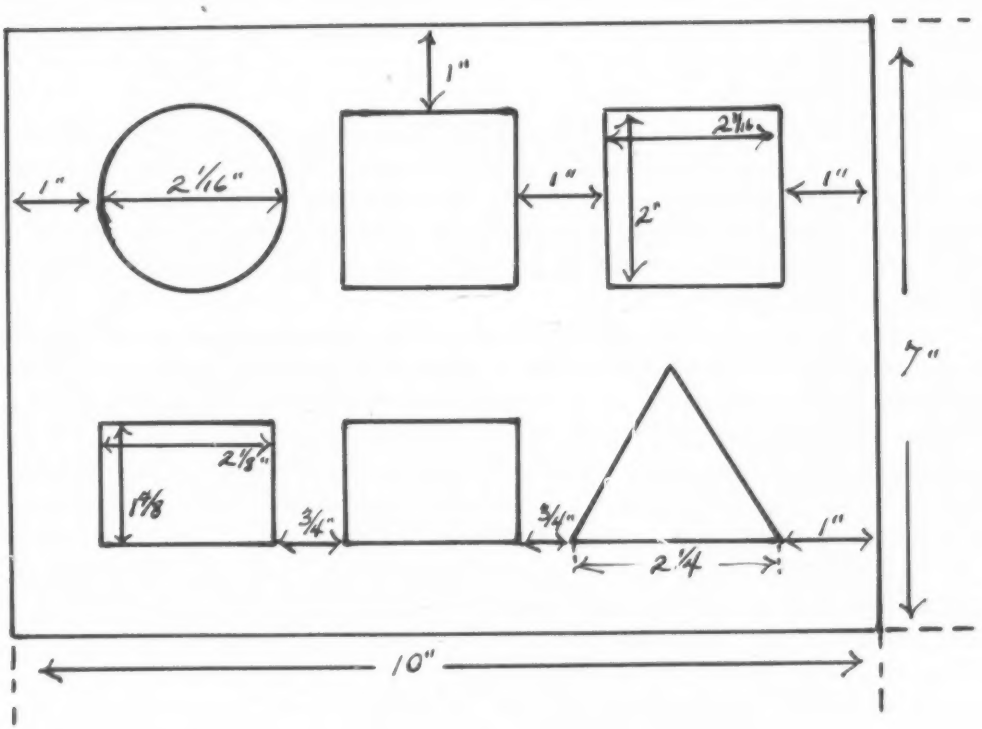
Step 1: From ¾" plywood cut blocks the following sizes: two squares 1⅞" × 1⅞"; two rectangles 2" × 1⅜"; one circle with a 2" diameter; one equilateral triangle with 2" sides.

Step 2: Base: From ⅜" plywood cut a piece 10" × 7".
From ¼" plywood cut a piece 10" × 7".

Step 3: In the ⅜" × 10" × 7" piece make cutouts as indicated in the diagram.

Step 4: Glue the two sections of the base together.

Step 5: Hammer twelve ⅜" upholstery tacks across the middle of the base as shown in the photograph.



SHAPE VARIATIONS

Description:

Two form boards, each having blocks of three different shapes, may be used individually or with the Basic Shape Board (page 66) in trays of two or three.

Purpose:

The three sections may be presented by two's or three's in a total of twelve arrangements to give a variety of practice in shape discrimination.

Behavioral Objective:

A. The child will be able to demonstrate his recognition of the diamond, rectangle, and half circle by naming each shape as he places it in the proper cutout.

B. After tactually exploring the oval, crescent, and heart blocks and their cutouts, the child will be able to place them in their proper cutouts.

C. Given combinations of two of the three boards, the child will demonstrate his recognition of the differences in six shapes by placing the blocks in their appropriate cutouts.

D. Given the three boards in various arrangements the child will demonstrate his recognition of the differences in nine shapes by placing the blocks in the proper cutouts.

Procedure and Use:

Starting with the board which has diamond, rectangle, and half-circle blocks, the child first identifies the shape of each block **in** the cutout board. Although he is familiar with a circle, the half-circle is new to him and will have to be explained. Then he removes each block and examines and describes the shape of each cutout. He replaces the blocks at random and then according to instructions. Finally, he should be able to name each shape accurately.

The board with oval, crescent, and heart blocks — all shapes unfamiliar to the child — is presented next. Although the names of these shapes should be given to the child and the shapes should be associated with things the child might know (Easter egg, moon, Valentine) it is not imperative that he be able to identify them by name at this point. He examines the blocks both in and out of the board and explores the shape of each cutout. Random replacement of the blocks is sufficient unless the child does know the names of the shapes in which case he should be able to replace them according to instructions.

Using the Basic Shape board combined with the diamond, rectangle, half-circle board, the same procedure followed with the Basic Shape Board (page 66) is followed with this teaching aid. Next, the Basic Shape Board is combined with the oval, crescent, heart board. Then the two new boards are used together. By using all possible combinations and positions, six arrangements may be made.

When a nine shape board is desired, the three boards may be combined in the larger tray in any arrangement. Six are possible, without including those in which the Basic Shape Board and diamond, rectangle, half-circle board are rotated. (The oval, crescent, heart board has a definite right side up). The same procedure followed with the two boards is followed here.

Shape Variations

Step 1: Board A: From ¾" plywood cut blocks the following sizes: Rectangle 3¼" × 1⅝"; half circle with 2½" diameter; diamond 3" × 2".
Board B: From ¾" plywood cut blocks the following sizes: oval cut from a 3⅛" × 1⅞" block; moon cut from a circular block with a 2½" diameter; heart cut from a 2½" × 2¾" block.

Step 2: Bases: From ⅜" plywood cut two pieces 4" × 12".
From ¼" plywood cut two pieces 4" × 12".

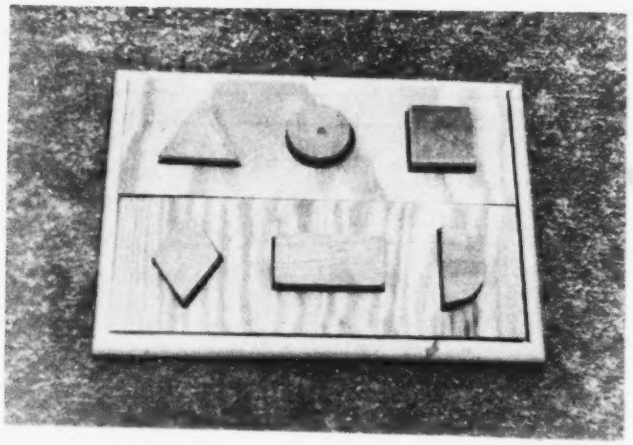
Step 3: Board A: In one 4" × 12" × ⅜" board make cut-outs for the half circle, rectangle, and diamond as shown. The cut-outs should be slightly larger in each dimension than the blocks.
Board B: In one 4" × 12" × ⅜" board make cut-outs for the oval, moon, and heart as shown. Make the cut-outs slightly larger than the blocks.

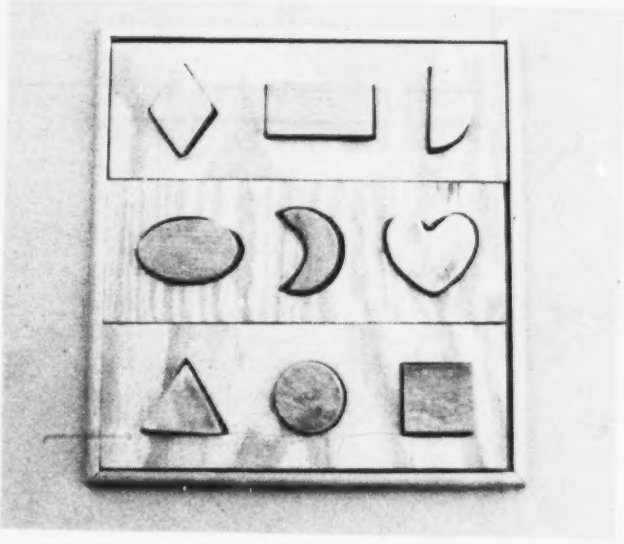
Step 4: Glue a 4" × 12" × ¼" board on the bottom of each cut-out board.

Trays

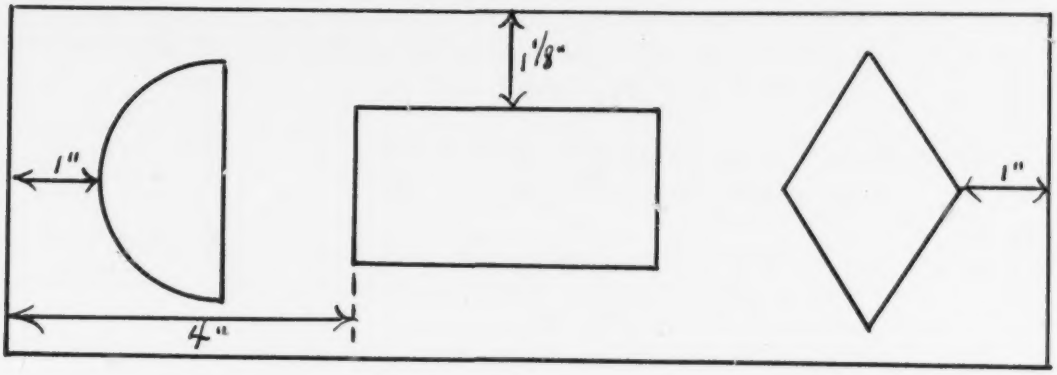
Step 1: From ¼" plywood cut a board 9¼" × 13¼" and a board 13¼" × 13¼".

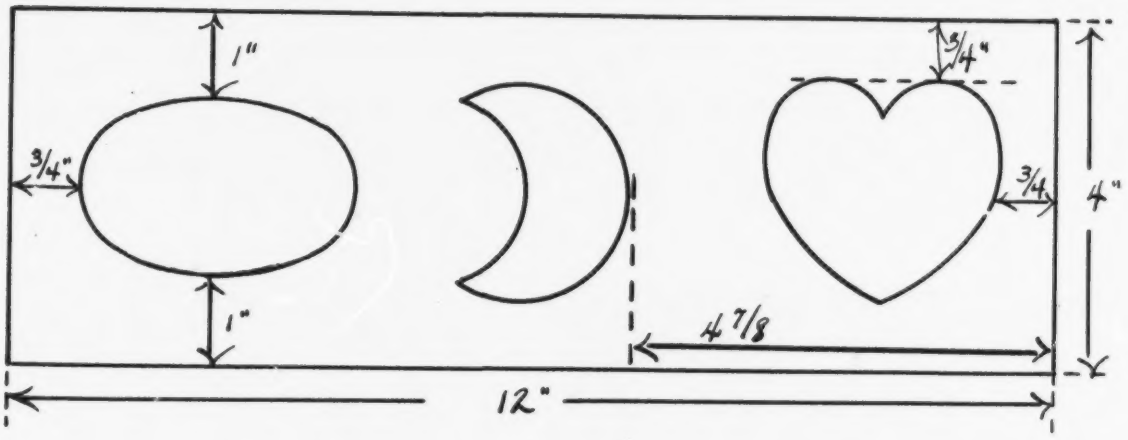
Step 2: Frame each board with strips of ½" quarter round glued and nailed in place.





Shape Variations





BIG AND LITTLE PEGS

Description:

Twenty-five pegs in two diameters but equal height and painted two contrasting colors are arranged checker board style in this pegboard.

Purpose:

The pegboard allows for recognition of size by grasp, the association of peg size with hole size, and an understanding of the alternating placement.

Behavioral Objective:

The child will be able to identify each peg and hole as large or small, and to place the pegs in sequence by rows as defined by hole size.

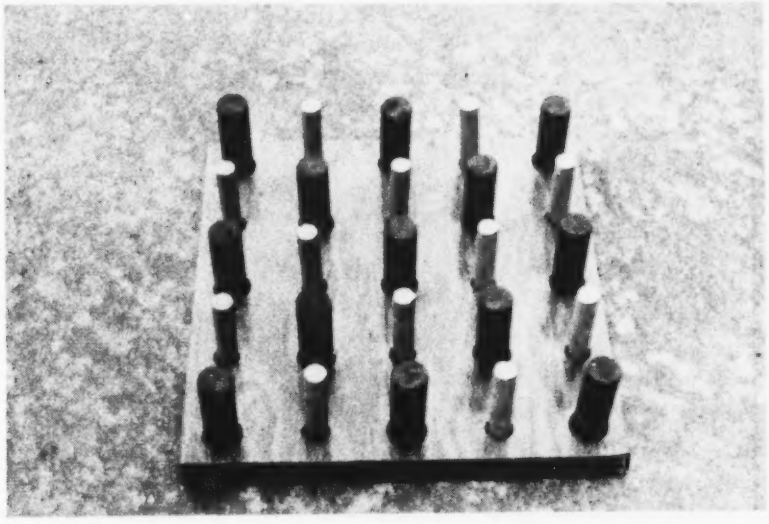
Procedure and Use:

By the time this peg board is presented to the child, he is familiar with peg boards and has worked with the size concept of big and little. He is given the peg board for random exploration to make discoveries on his own.

Next, more emphasis is put on the size of the pegs and the association of peg size and hole size. Placement in the peg board is still random until the child understands the alternate placement of the holes. Then the concepts of left to right rows and up and down columns is incorporated.

Variation:

An additional set of pegs could be made in which the small pegs are also shorter.



Big and Little Pegs

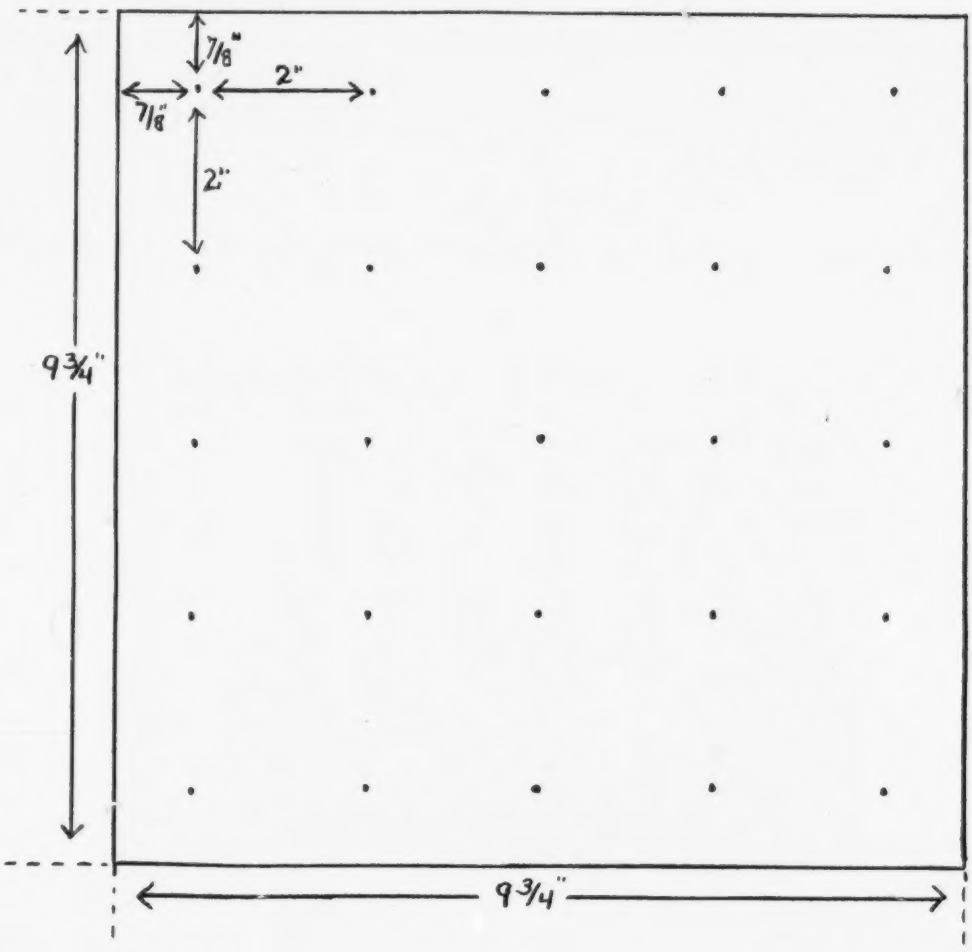
Step 1: Cut twenty-five 2¾" pegs as follows: 13 from ¾" dowels; 12 from ½" dowels.

Step 2: Base: From ¾" plywood cut a piece 9¾" × 9¾".
From ¼" plywood cut a piece 9¾" × 9¾".

Step 3: In the 9¾" × 9¾" × ¾" board drill twenty-five holes alternating 13/16" and 9/16" diameter holes checkerboard style, starting with the 13/16" holes on the odd numbered rows and with the 9/16" holes on the even numbered rows. The diagram indicates the center of each hole.

Step 4: Glue the two sections of the base together.

Step 5: Paint the large and small pegs contrasting colors.



SMALL, MEDIUM, AND LARGE PEGS

Description:

Eighteen pegs of three diameters (but equal height) are arranged in six vertical columns of like size.

Purpose:

This peg board extends the discrimination of size by grasp and the association of peg and hole size while introducing the concept of like vertical columns.

Behavioral Objective:

The child will be able to identify each peg hole and peg according to size and to place the pegs in sequence or in columns as directed.

Procedure and Use:

Much the same procedure as was followed for Big and Little Pegs (page 91) is used with this pegboard. The pegboard is presented first for exploration. Later the three sizes of pegs are identified and the association of peg size and hole size is pointed out if the child has not discovered this on his own.

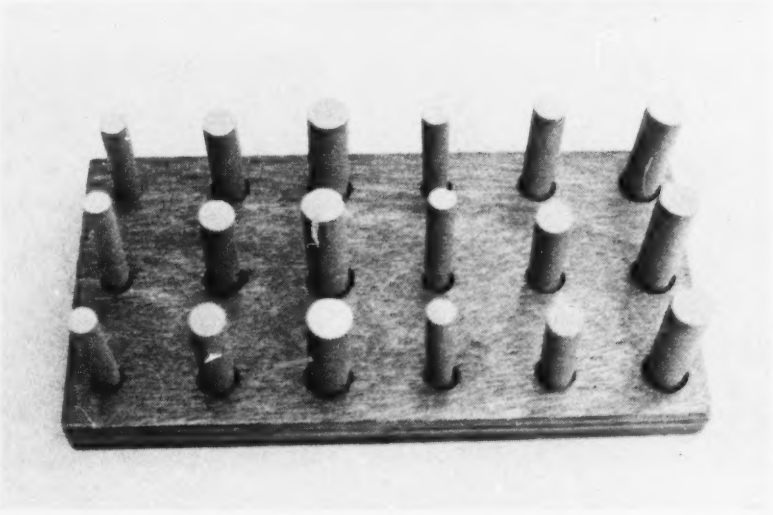
Random placement of the pegs comes first, followed by directed placement in sequential order by horizontal rows from left to right starting with the top row. Finally, the child is instructed to place the pegs in columns, starting with the column of small pegs at the left side of the board, and making successive columns across the board.

Variation I:

By using an additional set of pegs cut in three **heights** this same pegboard can be used to teach the concept short, medium, and tall.

Variation II:

Using the same original pegs, a new base can be made with holes in a more complex progressive sort of arrangement where difference in peg hole size is diagonal.



Small, Medium, and Large Pegs

Step 1: Cut eighteen 2¾" pegs as follows: six pegs ¾" in diameter; six pegs ⅝" in diameter; six pegs ½" in diameter.

Step 2: Base: From ¾" plywood cut a piece 5¾" × 11¾".
From ¼" plywood cut a piece 5¾" × 11¾".

Step 3: In the 5¾" × 11¾" × ¾" board drill eighteen holes. Each row is the **same** with the diameters of the six holes as follows: 9/16", 11/16", 13/16", 9/16", 11/16", 13/16". The diagram indicates the center of each hole.

Step 4: Glue the two sections of the base together.

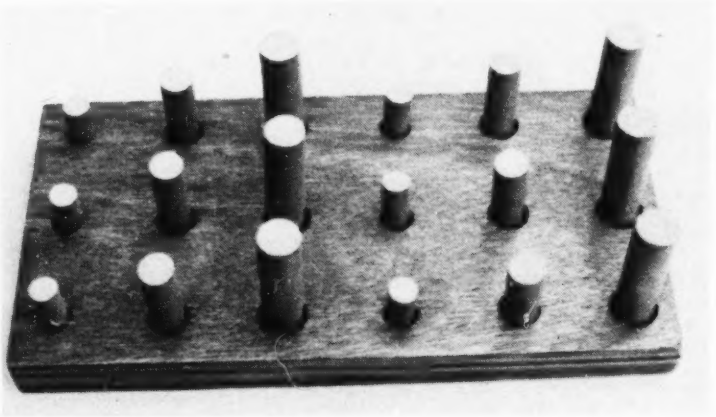
Step 5: Paint all pegs the same color.

Variation for Short, Medium, and Tall Pegs

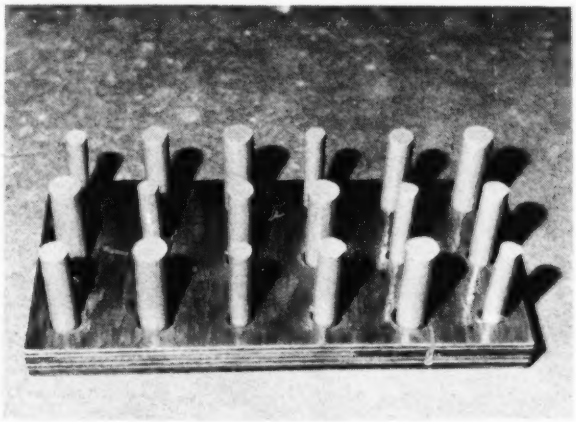
A. Use the same peg board made for Small, Medium, and Large Pegs.
B. Make an additional set of pegs as follows:
six pegs ½" in diameter 1½" high
six pegs ⅝" in diameter 2¼" high
six pegs ¾" in diameter 3" high

Variation for Peg Arrangement

A. Use the pegs cut for Small, Medium, and Large Pegs (all the same height).
B. Cut pieces for the base as shown in Step 2.
C. In the 5¾" × 11¾" board drill eighteen holes as follows:
Row 1. 9/16", 11/16", 13/16", 9/16", 11/16", 13/16"
Row 2. 11/16", 13/16", 9/16", 11/16", 13/16", 9/16"
Row 3. 13/16", 9/16", 11/16", 13/16", 9/16", 11/16"
D. Glue the two sections of the base together.

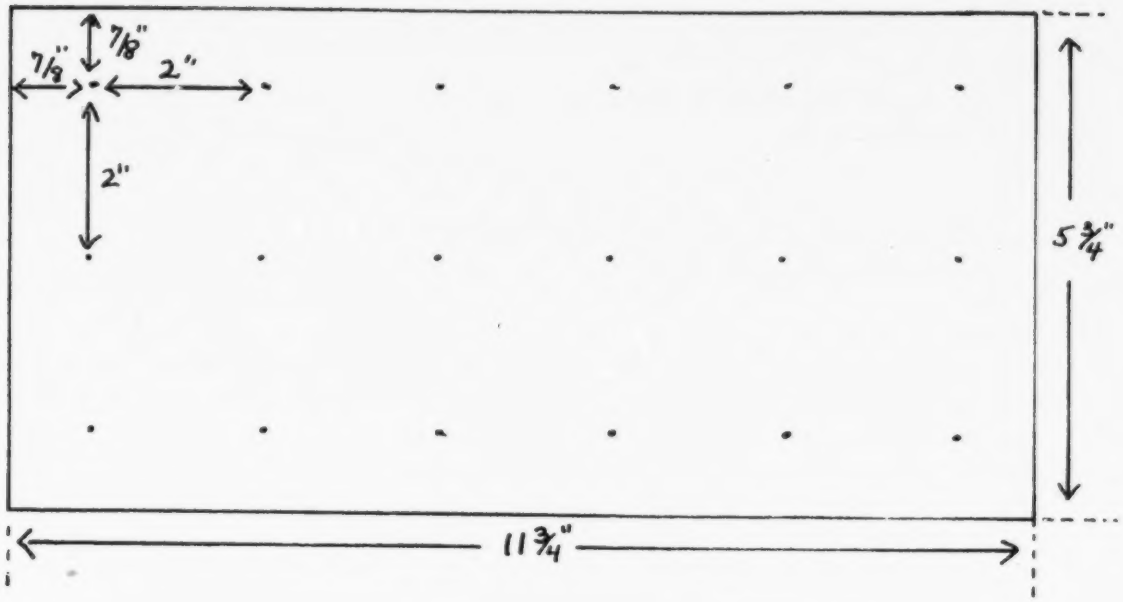


Variation I



Variation II

Small, Medium, and Large Pegs



IN AND OUT

Description:

Three rubber sink stoppers of different size, chained to the base, are placed in six holes.

Purpose:

The board provides the child with an opportunity to put in and take out sink stoppers, with which he is familiar.

Behavioral Objective:

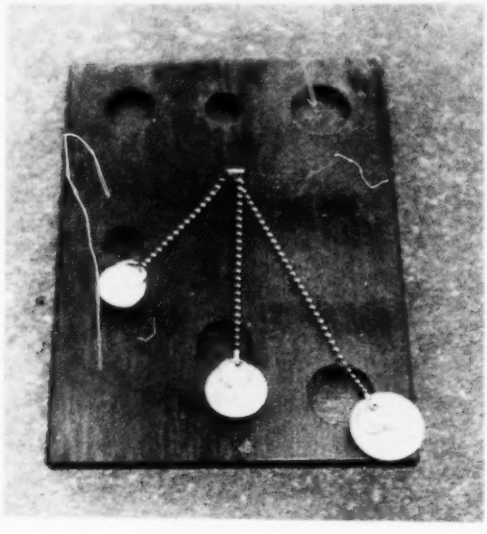
The child will demonstrate his understanding of the terms **in** and **out** by placing and removing the rubber sink stoppers in the appropriate size holes as instructed.

Procedure and Use:

The child identifies the stoppers, discussing the number and how they are different in size. He pulls out the stoppers, examines the size and position of the holes, and replaces the stoppers.

The child is first asked to place the stoppers in the "scattered holes" where placement is limited by the length of the chains. Then he places the stoppers in the top row of holes where he is required to make size discrimination.

This concept is re-enforced by relating it to his environment by such activities as putting things in boxes and taking them out.



In and Out

Step 1: Base: From ⅜" plywood cut a piece 8½" × 11½".
From ¼" plywood cut a piece 8½" × 11½".

Step 2: In the 8½" × 11½" × ⅜" board make six circular cut-outs with the diameters and in the positions shown in the diagram.

Step 3: Glue the two pieces of the base together. Paint a bright color.

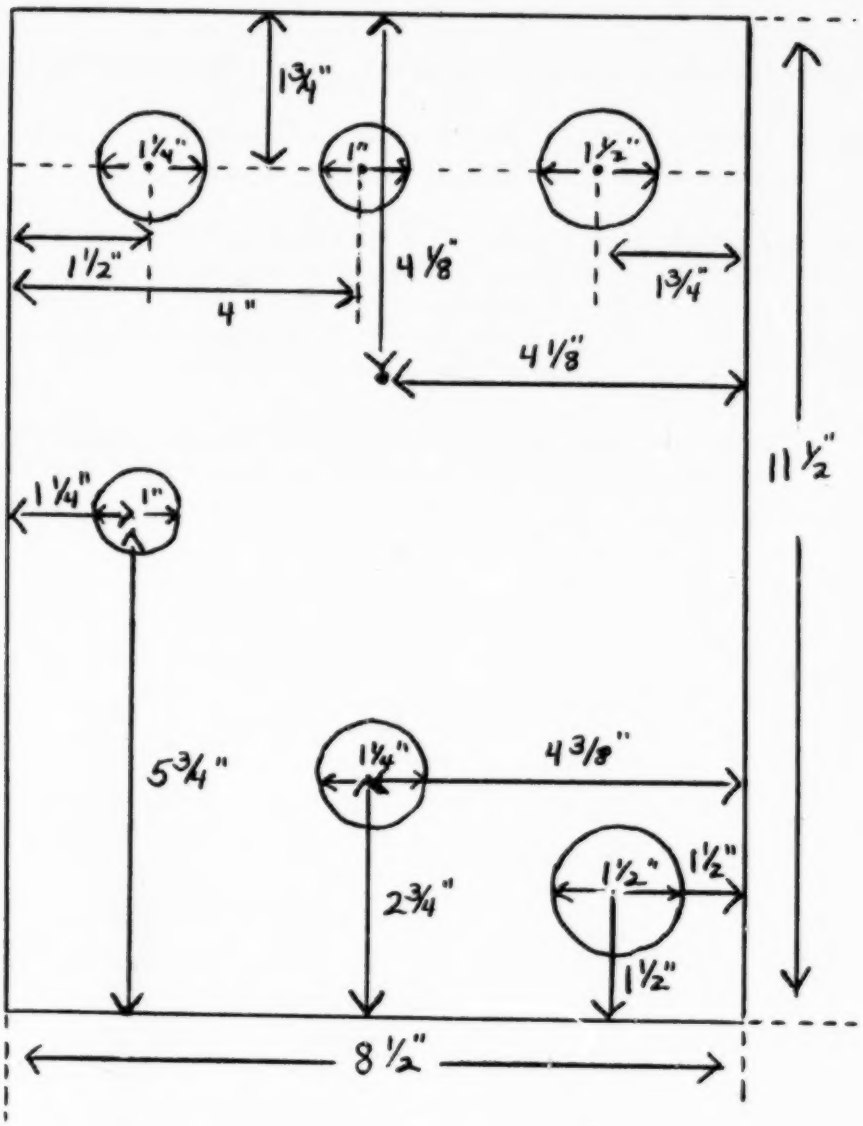
Step 4: Fasten a 1" screw-eye in the position indicated in the diagram, ending with the screw-eye parallel to the 8½" side of the base.

Step 5: Fasten rubber sink stoppers to the screw-eye using ball chains. From left to right the following stopper sizes and chain lengths are used:

⅞" - 1" stopper	3½" chain
1⅛" - 1¼" stopper	5" chain
1⅜" - 1⅞" stopper	7" chain

Note: The measurement of the chain is from the stopper ring to the screw-eye. Stoppers should be unable to reach the larger holes on the **lower** section of the base.

In and Out



ON TOP—UNDERNEATH

Description:

This one shelf rack may be used independently or with the wooden big and little circle and square boards (pages 22 and 41).

Purpose:

The vertical arrangement of this teaching aid provides practice in the spatial relationships which the child will need in his daily living.

Behavioral Objective:

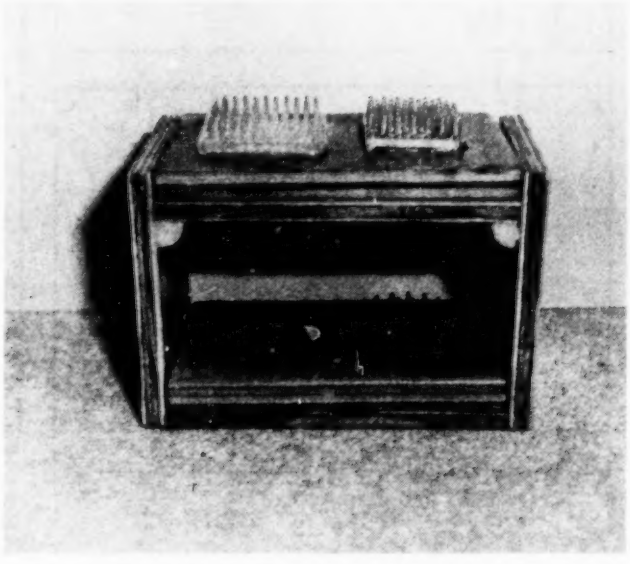
The child will demonstrate his understanding of the terms **on top of** and **underneath** by placing objects on or under the shelf as directed or by performing puzzle tasks on or under the shelf as instructed.

Procedure and Use:

The stand alone is given to the child to examine. Using objects, he learns the meaning of "on top of" and "underneath" the shelf.

The big and little boards are then placed on top and underneath the shelf. Replacing the pieces in the familiar puzzle makes the lesson more meaningful by adding the dimensions of size and shape to the basic lesson on position.

The concept of on top and underneath is re-enforced by pointing out things in the child's surroundings such as tables, shelves, lockers, etc.



On Top — Underneath

Step 1: From ⅜" plywood cut two pieces 4" × 6-5/16" for the shelves.

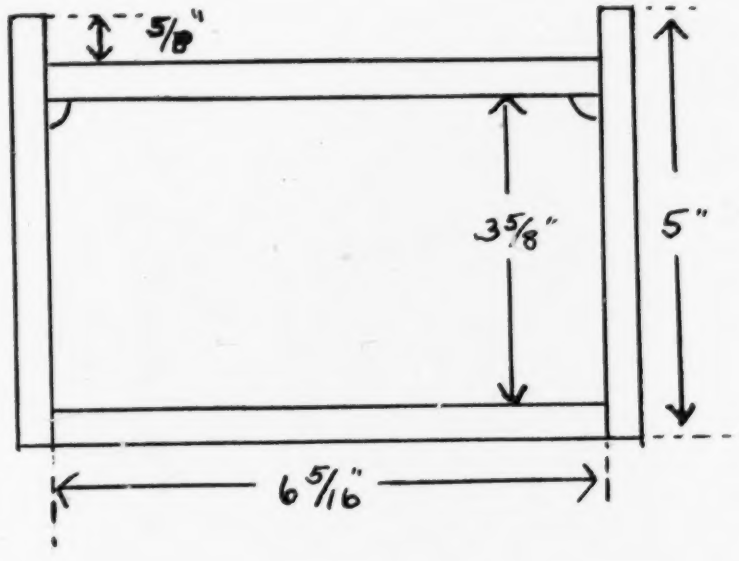
Step 2: From ⅜" plywood cut two pieces 4" × 5" for the sides.

Step 3: From ⅜" plywood cut a piece 5" × 7¼" for the back.

Step 4: Assemble stand as shown in the diagram, making sure that the top of the top shelf is ⅝" below the top of the side pieces. Fasten the shelves to the sides with small screws. Glue and nail the back into place.

Step 5: Cut two pieces of ½" quarter round 4" in length. Glue into place to support the top shelf.

Note: This stand may be used independently with objects or with two Textured Big and Little Circles and Squares as shown in the photograph.



UP AND DOWN

Description:

Wooden blocks or sponge squares are placed on dowel pegs extending from a vertical trapezoid stand.

Purpose:

By actually reaching up and down in a vertical plane the child will begin to understand this important concept of spatial relationships.

Behavioral Objective:

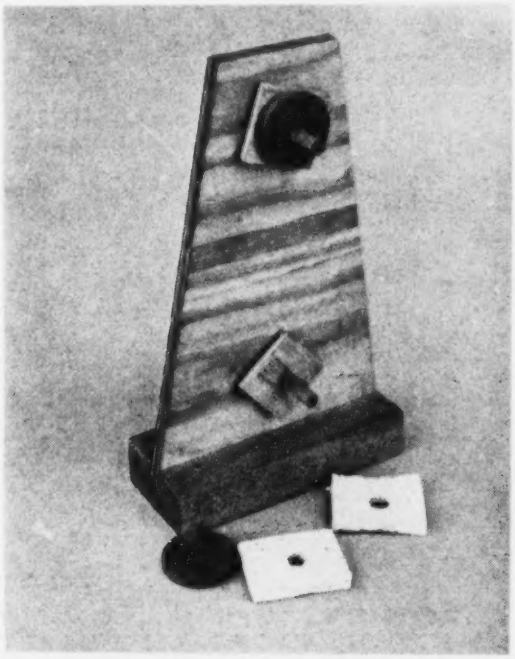
The child will demonstrate his understanding of the terms **up** and **down** by removing and replacing blocks on the pegs as directed.

Procedure and Use:

By this time the child should be able to identify the shapes and textures of the blocks used. He is asked to look up toward the top of the vertical board, examine and describe the blocks he finds, take them off and put them back. The emphasis is put on reaching up. Then the same procedure is followed with the pegs and blocks that are **down.**

This concept is one needed by children each day to understand position in space (such as the ceiling and floor) and in following simple directions. Just putting things into his locker he needs to know the terms "up" and "down".

The concept can be additionally re-enforced by games incorporating reaching up and down, jumping up and down, and other gross motor activities.



Up and Down

Step 1: From ⅝" plywood cut a trapezoid shaped stand 14" high, 4" at the top and 8¾" at the base.

Step 2: Cut two ½" dowels 2⅝" in length.

Step 3: Drill two holes ½" in diameter in the center of the trapezoid base, 2½" from the top edge and 2¾" from the bottom edge.

Step 4: Hammer the dowels into place in the holes leaving a 2" extension. Glue if necessary.

Step 5: Cut a base 8¾" × 3¾" × 1⅞".

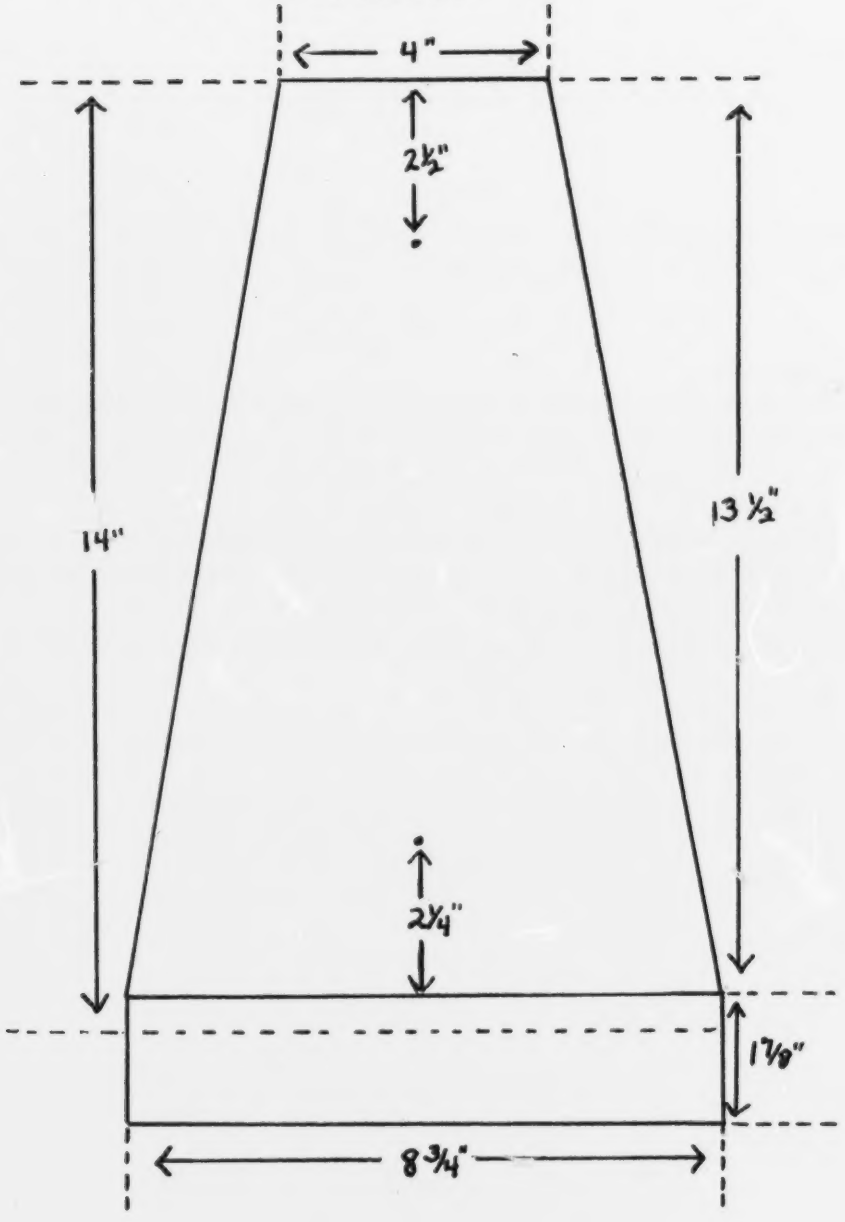
Step 6: Rout out a groove ½" deep and ⅝" wide in the base as shown.

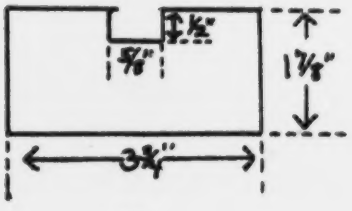
Step 7: Fasten the trapezoid stand into the base. Glue.

Step 8: Blocks: Two wooden squares ⅜" × 2⅜" × 2⅜".
Two wooden circles, ⅜" wood, 2¼" in diameter.
Two ½" sponge squares 2½" × 2½".

Step 9: Drill ⅝" holes in the centers of the wooden blocks and cut ⅝" holes in the centers of the sponge squares.

Up and Down





TOP AND BOTTOM

Description:

Triangular blocks pointing up and down are placed at the top and bottom of a cutout base.

Purpose:

Placing the blocks in position on a flat surface teaches terms which will be needed for reading or writing. The directional pointing of the triangles furnishes an additional clue.

Behavioral Objective:

The child will demonstrate his understanding of the terms **top** and **bottom** by placing the triangular blocks correctly when asked to do so.

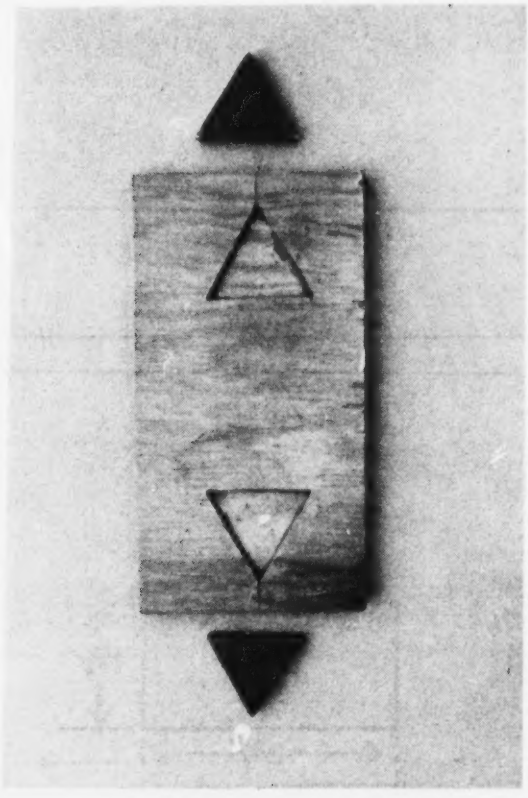
Procedure and Use:

The child is asked to find what is at the top and the bottom of the board. The different positions of the triangles (pointing up and down) are pointed out to him. He is asked to remove and replace the blocks as directed.

This concept is constantly re-enforced when children handle equipment as they work.

Variation:

The board can be used to teach left and right by turning it in a horizontal position.



Top and Bottom

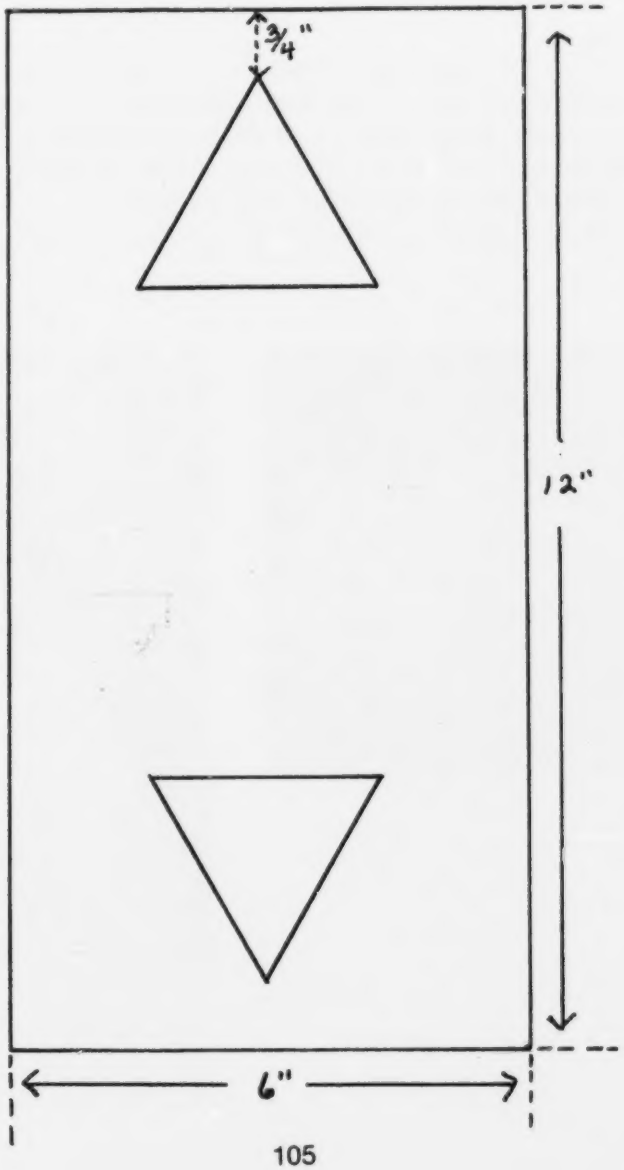
Step 1: From ⅝" plywood cut two equilateral triangles with 2¾" sides.

Step 2: Base: From ⅜" plywood cut a piece 6" × 12".
From ¼" plywood cut a piece 6" × 12".

Step 3: In the ⅜" × 6" × 12" piece make two cutouts slightly larger in each dimension than the triangular blocks. The apex of the triangular cutouts is centered ¾" from the edge as shown.

Step 4: Glue the two sections of the base together.

Step 5: Paint the blocks a bright color.



OVER AND UNDER

Description:

Clothesline cord fastened at the left side is woven over and under dowel pegs extending from a vertical board with the top cut to indicate the over - under pattern.

Purpose:

By actually manipulating the cord in a gross weaving pattern the child learns by practical application the meaning of over and under.

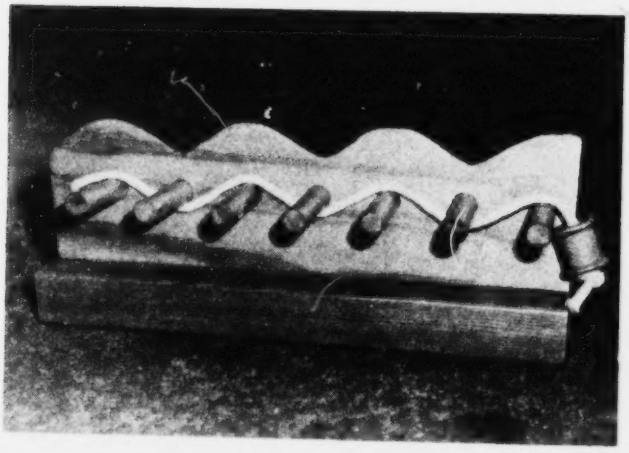
Behavioral Objective:

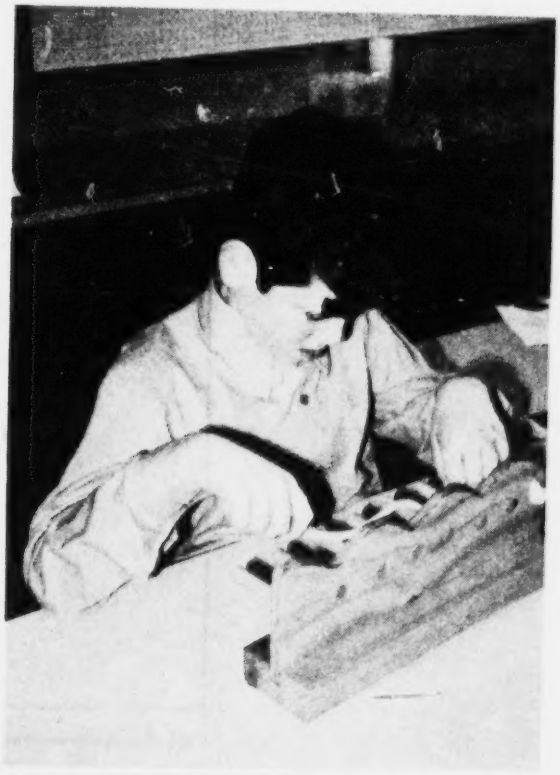
The child will demonstrate his understanding of the terms **over** and **under** by tracing the path of the cord over and under the dowels with his finger and then weaving the cord following the same pattern.

Procedure and Use:

The child is shown the scalloped top edge of the board and is guided to follow the contour. Holding the child's hand the teacher weaves the cord over and under the dowel pegs saying, "over, under," as she does so. Then the child traces the path of the cord with his finger, assisted by the teacher if necessary. Later the child should be able to do these operations independently with careful supervision.

The over-under principle is re-enforced by simple weaving.





Over and Under

Step 1: From a ⅝" dowel cut seven pegs 3" long.

Step 2: From ½" plywood cut a piece 14¾" × 5".

Step 3: Cut the top of the 14¾" × 5" × ½" piece as shown in Figure 1.

Step 4: Drill ⅝" holes in the board in the positions indicated in the diagram.

Step 5: Hammer the dowel pegs into the holes so that the pegs are flush with the back side and extend 2½" on the front.

Step 6: Cut a piece of clothesline approximately 22" long; place a wooden spool on one end and knot securely.

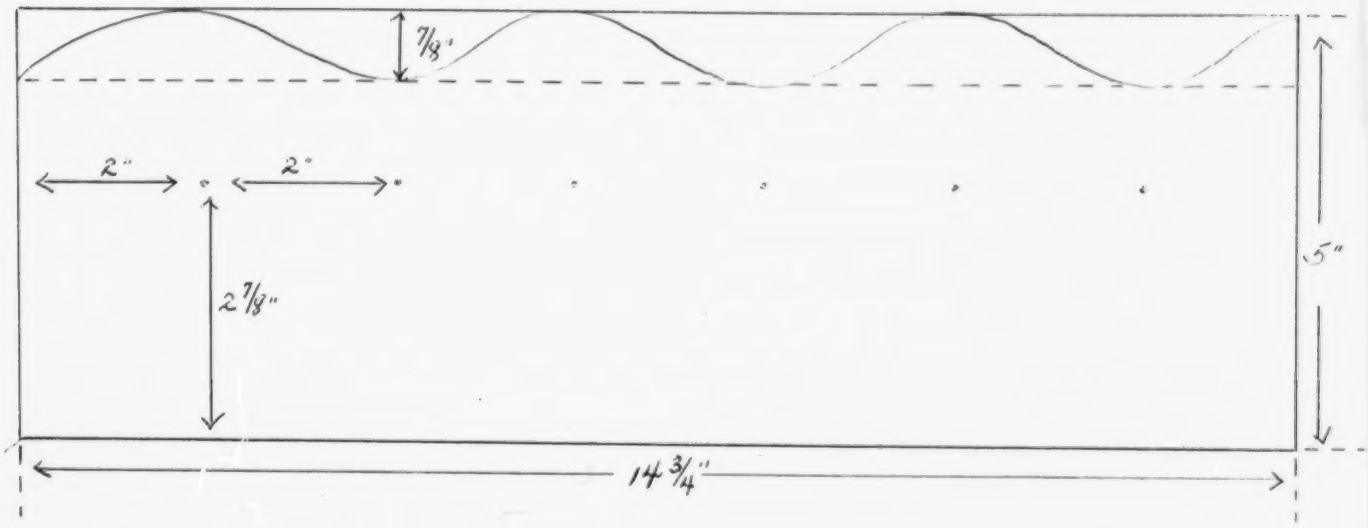
Step 7: On the left side of the scalloped board drill a hole just large enough for the clothesline in line with the row of pegs. Insert the free end of the clothesline and knot on the back.

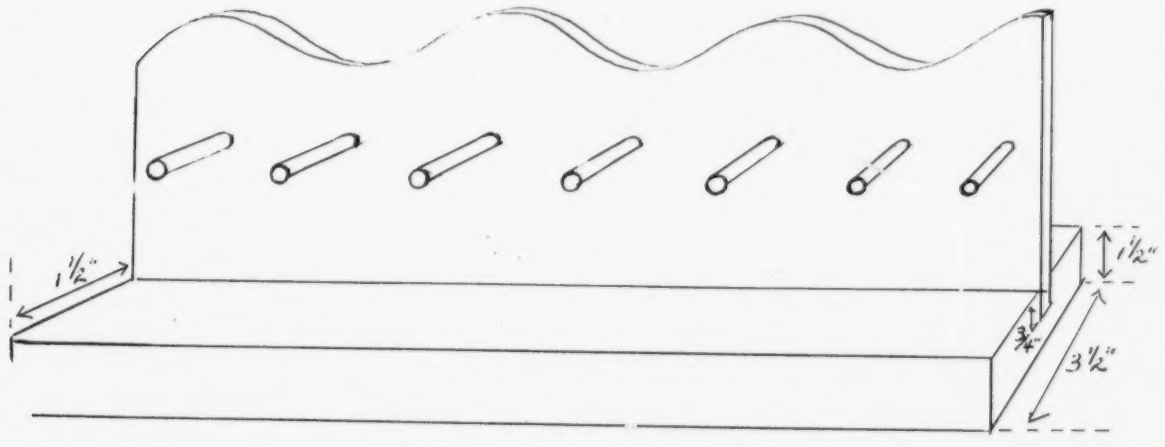
Step 8: From a 3½" × 1½" board cut a piece 14¾" long.

Step 9: In the center of the 3½" side of the board cut in Step 8 rout out a groove ½" wide and ¾" deep.

Step 10: Insert pegged board in groove and glue in place as shown in Figure 2.

Over and Under





POSITION PEG BOARD

Description:

Six pegs are placed on four sides of a stationary center post.

Purpose:

The various positions of the holes in this pegboard allow for spatial orientations in relation to a fixed point and for understanding terms denoting position.

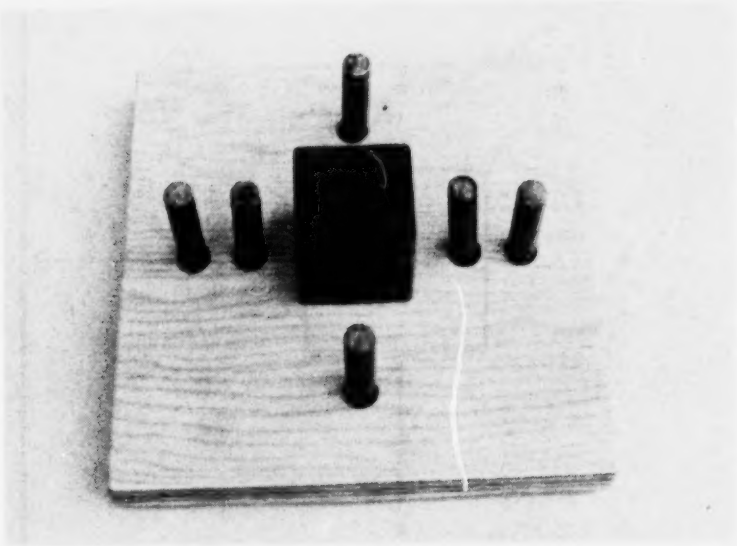
Behavioral Objective:

The child will be able to place pegs in relation to the center cube as directed.

Procedure and Use:

To begin with, the board is placed in front of the child in the position having one peg on each side of the cube. After locating the stationary cube in the middle of the board, the child is asked to find how many pegs are on the left and on the right and at the top and bottom.

When the child is ready, the concepts of "in front of" and "behind the cube" can be introduced. Then the board can be rotated so that there are two pegs on each side of the cube. With the board in this position the child is asked which peg is near the cube and which one is farther away. Games can be played by taking out the pegs at designated positions.



Position Peg Board

Step 1: From a ½" dowel cut six pegs 2¾" high.

Step 2: From a 2" × 2" piece of wood cut a post 2" high. (Note: The size of the post may vary, but the height should remain 2".)

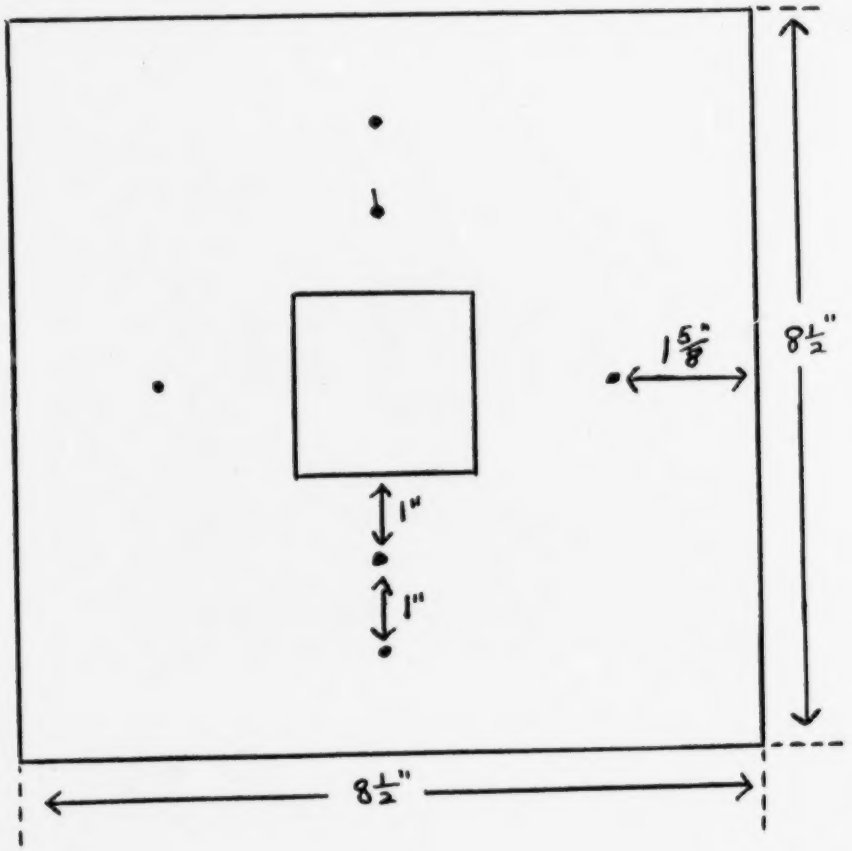
Step 3: Base: From ¾" plywood cut a piece 8½" × 8½".
From ¼" plywood cut a piece 8½" × 8½".

Step 4: In the 8½" × 8½" × ¾" board drill six holes 9/16" in diameter as shown in the diagram.

Step 5: Glue and nail the post cut in Step 2 in the center of the 8½" × 8½" × ¾" board with the peg holes.

Step 6: Glue the two sections of the base together.

Step 7: Paint the post and pegs a bright color.



POSITION TRIANGLES

Description:

Four identical isosceles triangular blocks are fitted into cutouts in four different positions.

Purpose:

The blocks are identical; emphasis is put on the position of placement of each block.

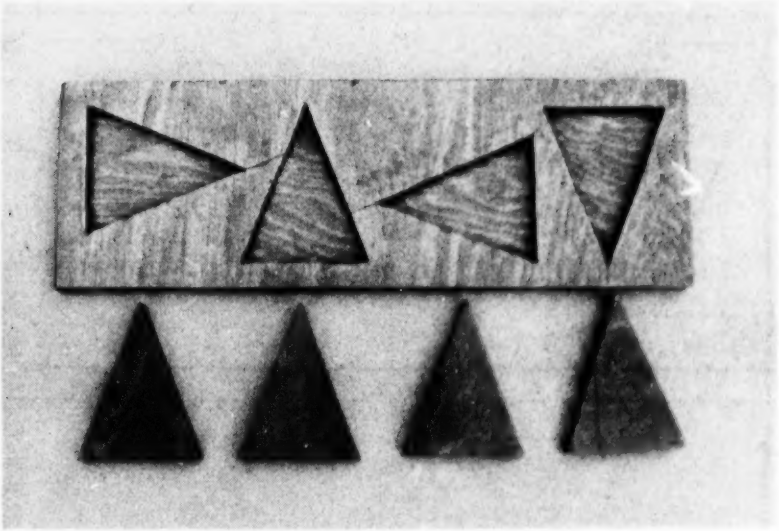
Behavioral Objective:

The child will be able to remove the triangles, examine the cutouts for the longest point, and replace the triangles as instructed: "point right", "point up", "point left", "point down".

Procedure and Use:

The triangular blocks are identified and counted in the board and the child's attention is called to the position of the top point of each one. The blocks are removed and the cutouts are examined for position. As the blocks are being replaced, the child is asked to find the direction of the point on each one (right, top, left, bottom).

Re-enforcement of directions comes with games, raised pictures, and incorporated in gross motor activities.



Position Triangles

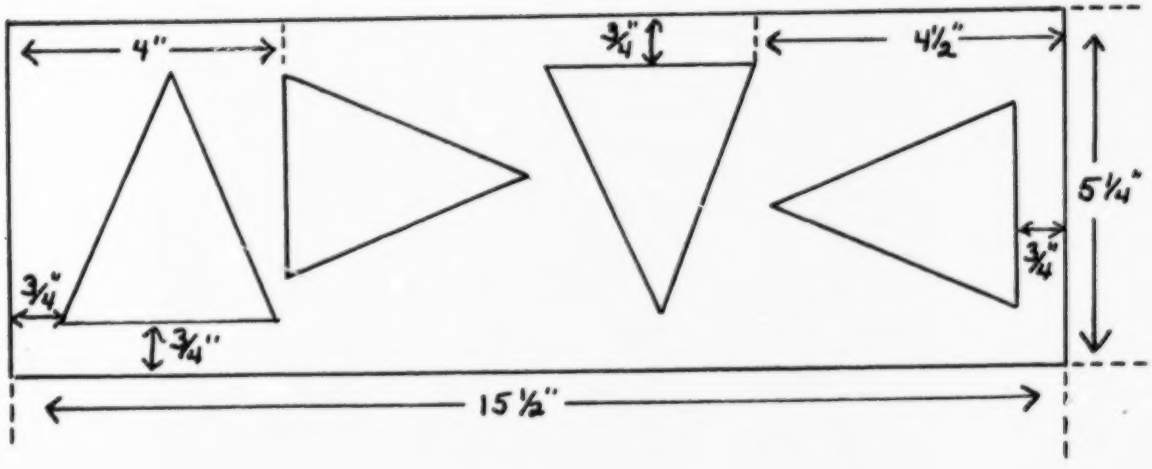
Step 1: From ⅝" plywood cut four isosceles triangles with a 2⅞" base and 3⅝" altitude.

Step 2: Base: From ⅜" plywood cut a piece 5" × 15¼".
From ¼" plywood cut a piece 5" × 15¼".

Step 3: In the ⅜" × 5" × 15¼" board cut in Step 2 make four triangular cutouts with a 3⅛" base and 3⅞" altitude as shown in the diagram.

Step 4: Glue the two sections of the base together.

Step 5: Paint all four blocks the same color.



WIDE AND NARROW

Description:

A wide and narrow block, the same thickness and color, fit into a base.

Purpose:

Keeping all other dimensions constant, the factor of width is the only one the child must consider in placing the blocks.

Behavioral Objective:

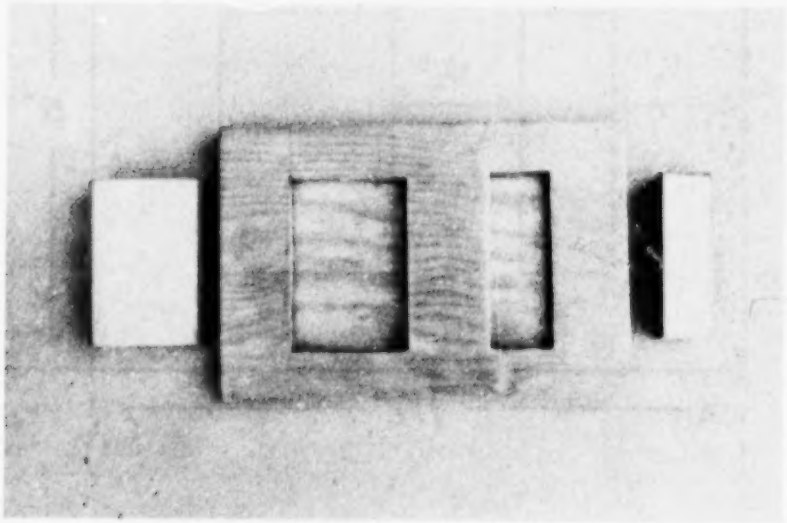
The child will demonstrate his understanding of the terms **wide** and **narrow** by placing the blocks in the cutouts as directed.

Procedure and Use:

The child is asked how many pieces are in the board. He is shown which one of the two is wide and which one is narrow. He is then directed to take the pieces out of the board, identifying each as he does so, and to replace them as directed.

The board can be turned around so that the blocks are not always in the same position. The child can be asked which one is on the left and which one is on the right.

The terms "wide" and "narrow" can be re-enforced with raised pictures and by the comparison of objects and spaces in the child's environment.



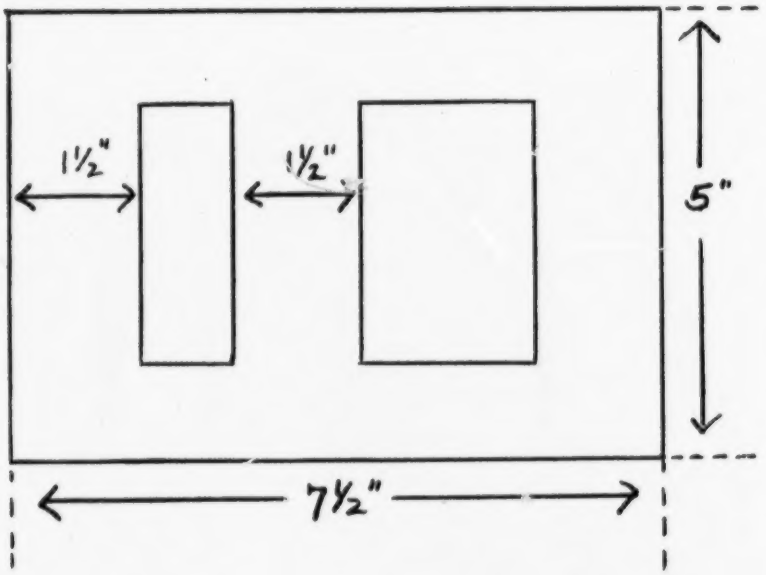
Wide and Narrow

Step 1: From ¾" wood cut one block 1" × 3" and one block 2" × 3". Paint.

Step 2: Base: From ⅜" plywood cut a piece 7½" × 5".
From ¼" plywood cut a piece 7½" × 5".

Step 3: In the 7½" × 5" × ⅜" board make two cutouts slightly larger than the blocks cut in Step 1 as shown in the diagram.

Step 4: Glue the two sections of the base together.



THICKNESS SEQUENCE BOARD

Description:

Five blocks the same size but varying in thickness from ⅜" to 1⅝" are placed in order of increasing thickness in a cutout board.

Purpose:

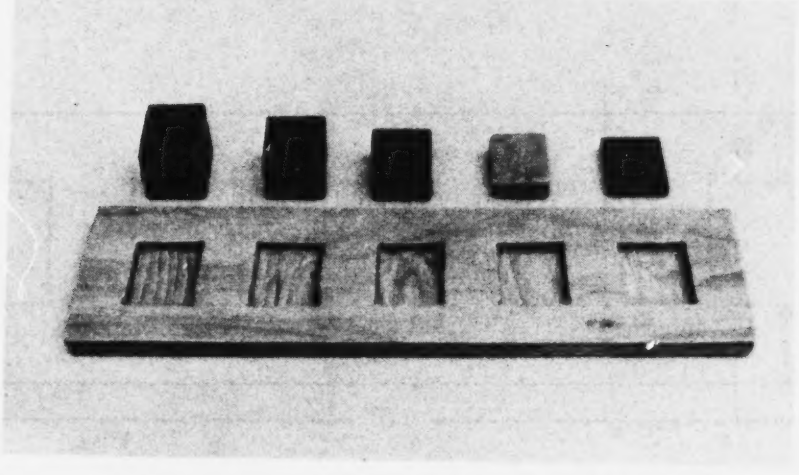
Keeping the size constant, the teaching aid focuses on tactual discrimination of degrees of thickness and sequential order.

Behavioral Objective:

The child will be able to order the blocks according to thickness and place them in the board in a sequential manner.

Procedure and Use:

Examining the board the child is asked how many blocks there are and what shape they are. As he takes them out and replaces them he is shown that they are different in thickness. Out of the board he distinguishes the thickest and thinnest and then notes the progression from thick to thin before replacing them in the cutouts.



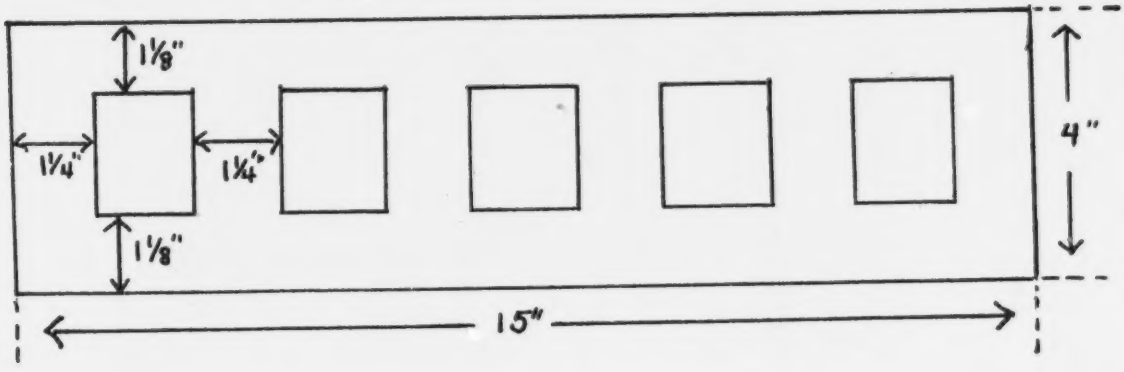
Thickness Sequence Board

Step 1: Cut five blocks 1-7/16" × 1-11/16" the following thicknesses: ⅜", ½", ¾", 1⅛" (¾" + ⅜"), 1½" (¾" + ¾").

Step 2: Base: From ¼" plywood cut **two** pieces 4" × 9".

Step 3: In one of the 4" × 9" pieces cut in Step 2 make five cutouts 1½" × 1¾" as shown in the diagram.

Step 4: Glue the two sections of the base together.



THICK AND THIN

Description:

A selected two of three blocks the same size but different thickness are placed in two cutouts in a base.

Purpose:

The three thickness of blocks allows for observance of the relative nature of thick and thin.

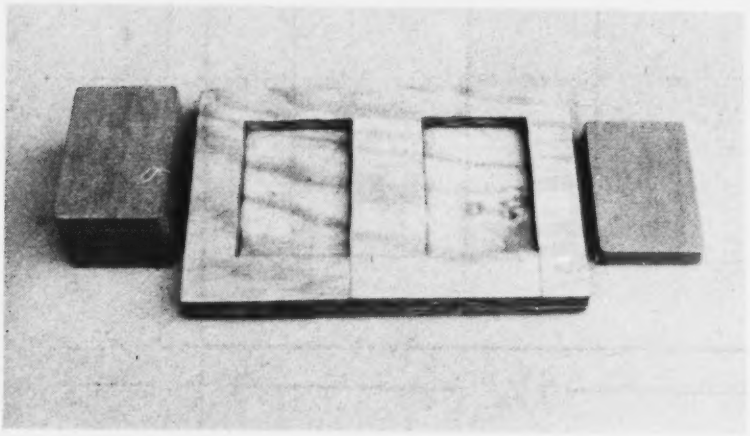
Behavioral Objective:

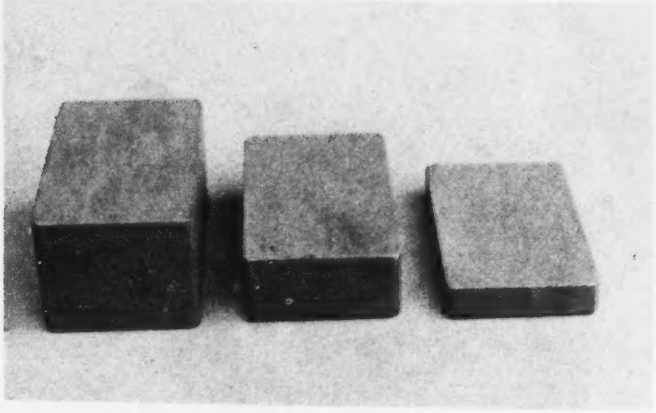
The child will demonstrate his understanding of the relative thickness of two blocks by selecting the requested block and placing it in a cutout according to instructions.

Procedure and Use:

The thickest and thinnest of the three blocks are given to the child outside of the puzzle. When the base is shown to him it is noted that the cutouts are the same size. With the blocks in place in the puzzle the child is asked which one is thick and which one is thin. Later the block of intermediate thickness is introduced so that the child can see more subtle differences in thickness.

The concept is re-enforced by the comparison of thick and thin objects in the environment.





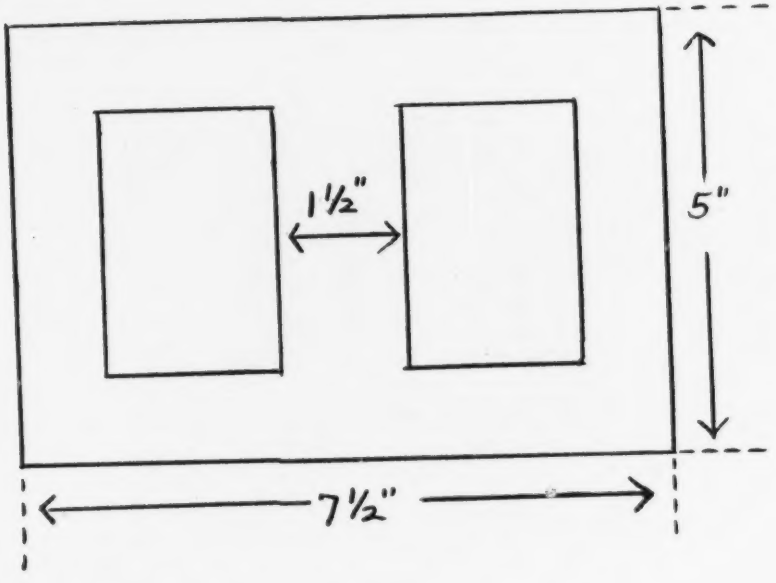
Thick and Thin

Step 1: Cut three 2" × 3" blocks the following thicknesses: ½", 1", 1⅝". Paint.

Step 2: Base: From ⅜" plywood cut a piece 7½" × 5".
From ¼" plywood cut a piece 7½" × 5".

Step 3: In the 7½" × 5" × ⅜" piece make two cutouts slightly larger than the blocks cut in Step 1 as shown in the diagram.

Step 4: Glue the two sections of the base together.



DEPTH PERCEPTION

Description:

Two rows of tall pegs the same height go through the top board into the deeper holes in the base.

Purpose:

The space between the two boards is wide enough for the child to put his hand between and understand the spatial relationship between two levels.

Behavioral Objective:

The child will be able to remove all pegs and replace them accurately through both levels of holes.

Procedure and Use:

The child is first shown the board without the pegs to examine both levels of holes and put his hand in the space between. Then he is given the pegs and instructed to put them through the aligned holes. He is shown how to guide the pegs into the bottom hole with his finger.

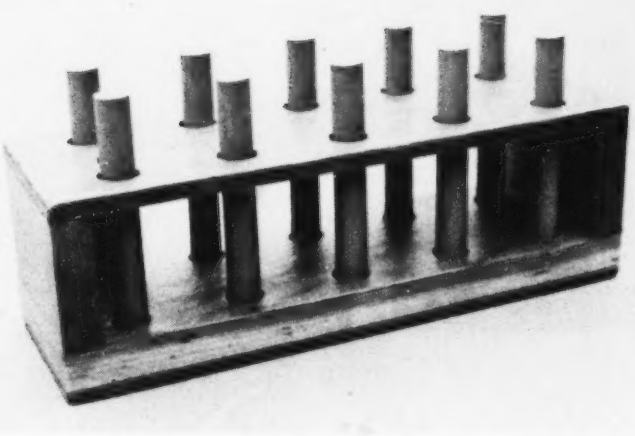
The concept of rows and left and right can be incorporated.

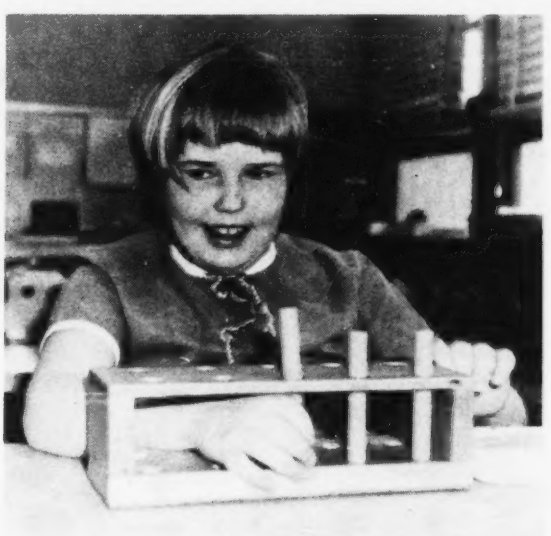
Variation:

With the same double pegboard, pegs of graduated heights may be used to add the dimension of matching and comparing heights.

Other Materials:

A double pegboard with plexiglass top and a greater number of short pegs is available.





Depth Perception

Step 1: From ⅝" dowels cut ten pegs 5" high. Paint all one color.

Step 2: From ⅜" wood cut a piece 12" × 4".

Step 3: From ¾" wood cut a piece 12" × 4".

Step 4: Drill corresponding holes 11/16" in diameter as shown in Figure 1 in the boards cut in Steps 2 and 3.

Step 5: From ¼" wood cut a piece 12" × 4".

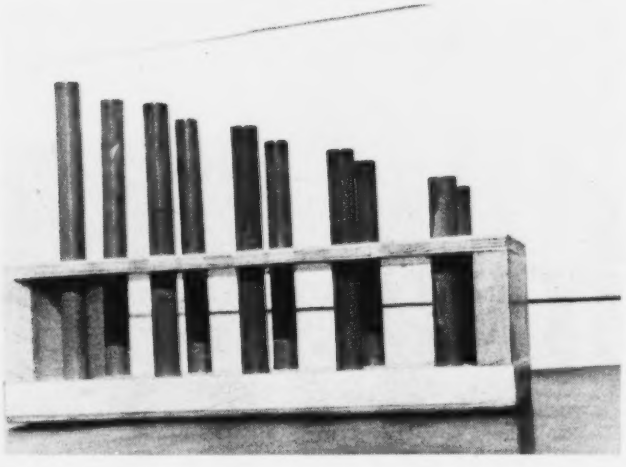
Step 6: Glue the 12" × 4" × ¾" peg board (cut in Step 3) to the board cut in Step 5 for a base.

Step 7: From ¾" wood cut two pieces 2½" × 4".

Step 8: Assemble the base, two end pieces, and top peg-hole board as shown in Figure 2, having the peg holes in alignment.

Variation for Height and Depth Perception

A. From ⅝" dowels cut **two** pegs of each of the following heights: 5", 5¾", 6½", 7¼", 8".
B. Paint these ten pegs a different color from those painted in Step 1.



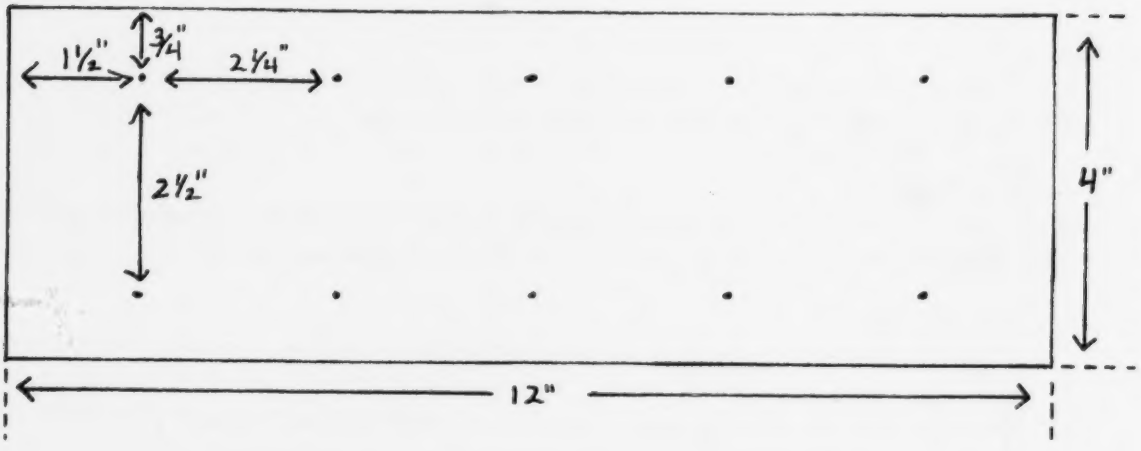


Fig. 1

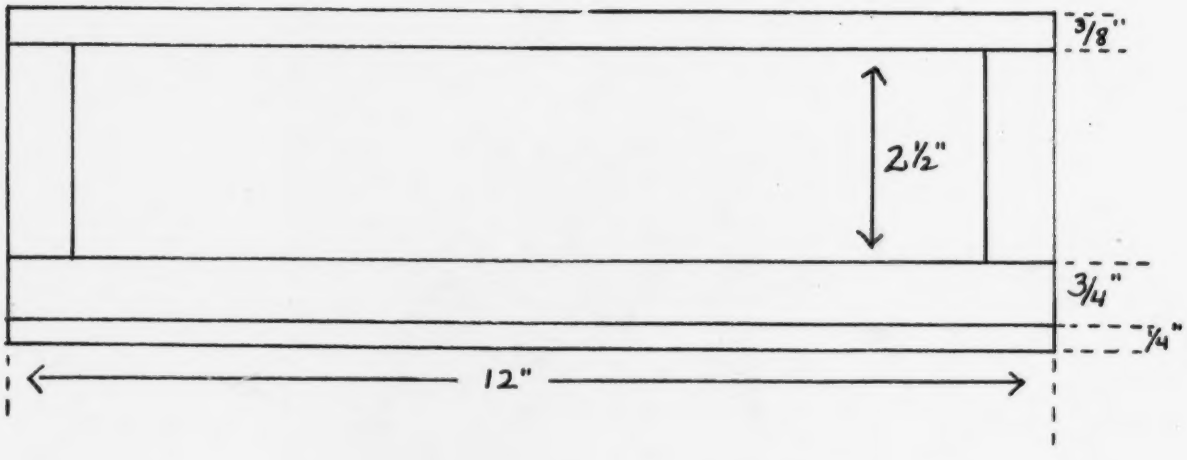


Fig. 2

FRONT AND BACK

Description:

Bamboo cylinders are placed on dowel rods extending in front and in back of a vertical stand.

Purpose:

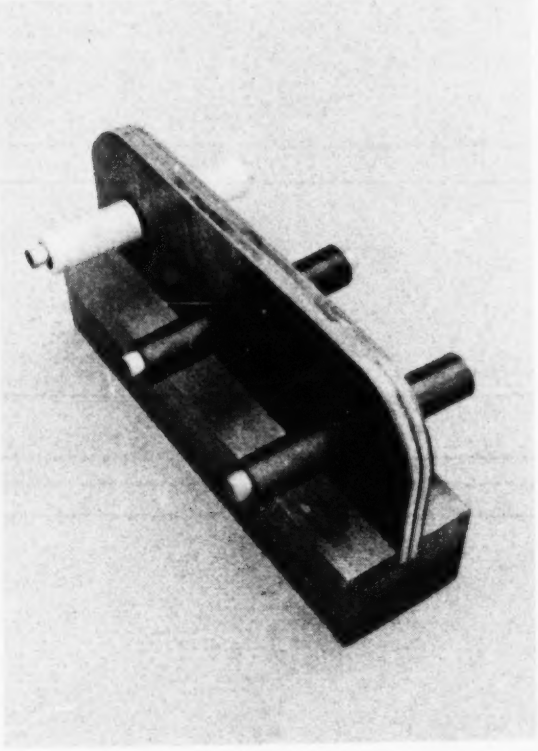
Actually placing objects on the front and back sides of the vertical stand aids in the understanding of this vital concept of spatial relationships.

Behavioral Objective:

The child will demonstrate his understanding of the terms **front** and **back** by placing the cylinders correctly on the front side and on the back side as directed.

Procedure and Use:

The child is directed to examine the front of the stand with the cylinders fitted on the projecting pegs. He counts the cylinders and pegs, taking the cylinders off and replacing them, randomly and then as directed. Then he is shown the back side of the stand and the same procedure is followed. Re-enforcement comes from examining things familiar to the child in the room, pointing out front and back sides. He may also learn to position himself in front of or behind objects, and to place objects in front and in back of himself.



Front and Back

Step 1: From ¾" plywood cut a rectangle 5¼" × 13¼". Round two corners as illustrated.

Step 2: Cut three ⅝" dowels 6¾" long.

Step 3: Drill three ⅝" holes in the rectangle as shown.

Step 4: Hammer the dowels through the holes leaving a 3" extension on each side.

Step 5: Cut a base 3½" × [illegible] × 13¼".

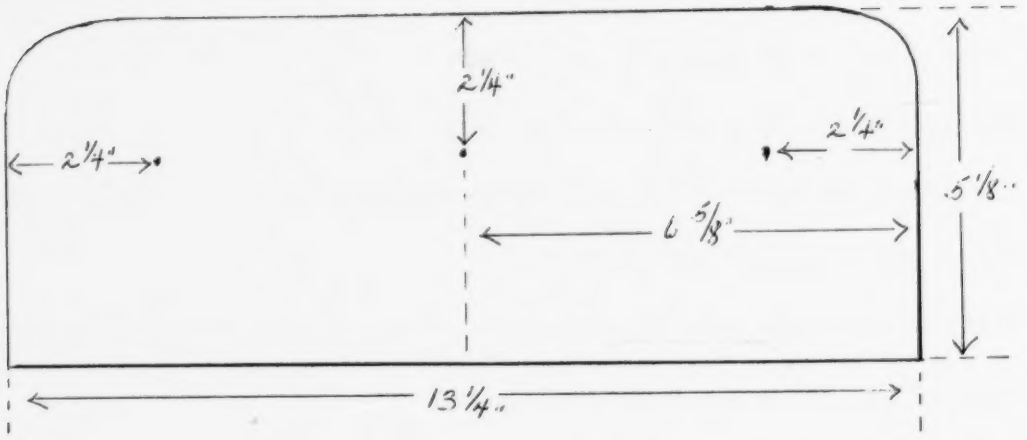
Step 6: Rout out a groove ½" deep and ¾" wide down the center of the base as shown.

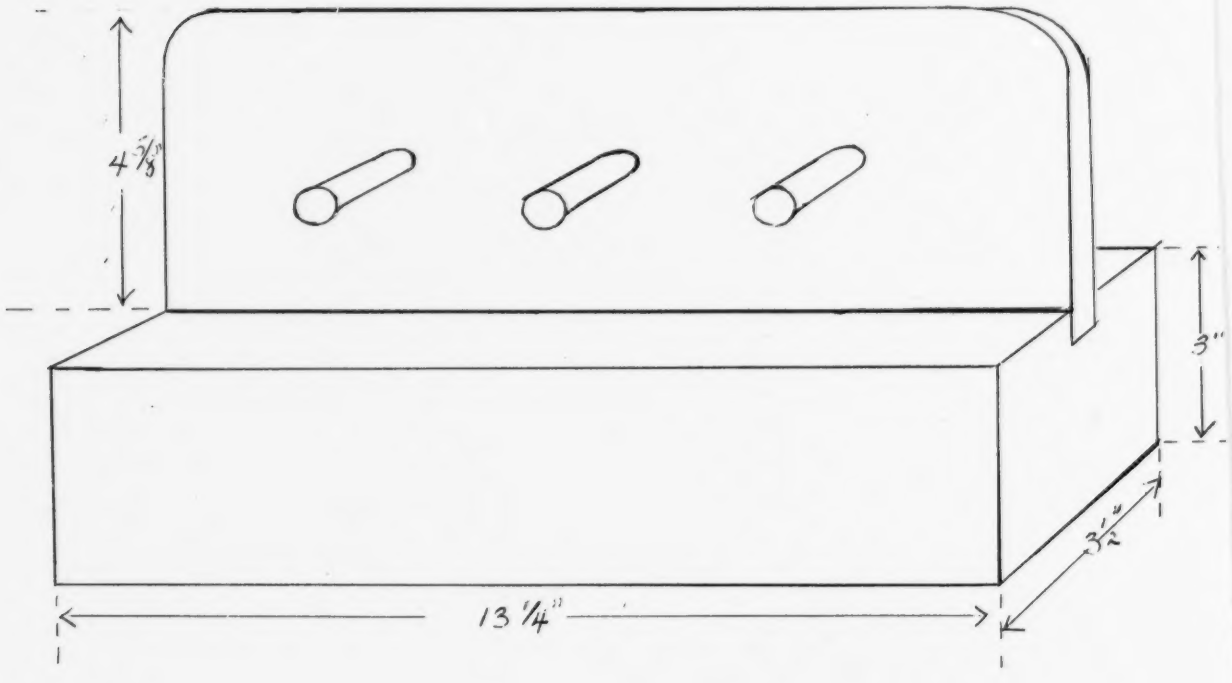
Step 7: Fasten the rectangle into the base with glue.

Step 8: Cut six bamboo cylinders 3" in length having an inside diameter of approximately ¾".

Step 9: Paint two cylinders red, two blue, two yellow.

Front and Back





SOUND MATCHING I

Description:

Twelve metal film cans containing two materials which make distinctive sounds when shaken are inserted into a circular wooden tray.

Purpose:

The board can be used for pure manipulation and handling of the peg cans, for discrimination of two sounds, and grouping of sounds.

Behavioral Objective:

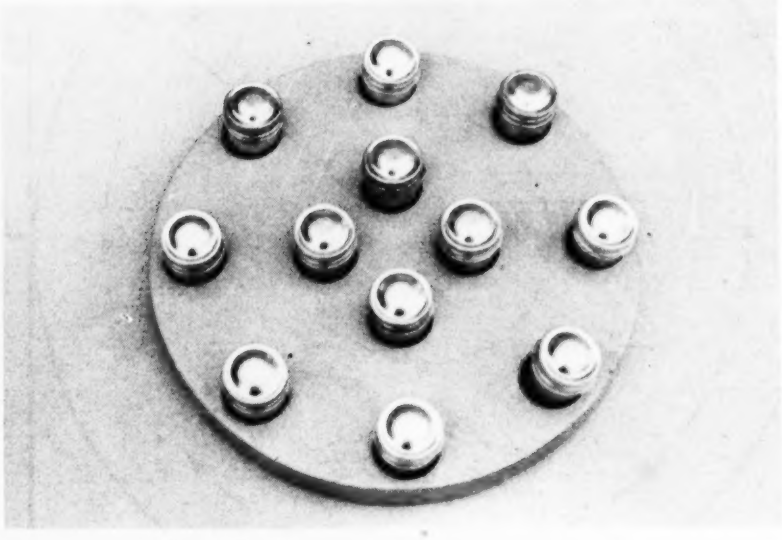
The child will examine film cans, manipulating the containers to get sound, and will replace them in the board.

Procedure and Use:

The board is presented to the child to explore. He notes the two different sounds when he shakes the containers, randomly removing and replacing them in the board.

With the teacher's help he distinguishes between sounds that are alike and different. Although he has had the concept of likeness and difference before, he has not practiced using it in auditory discrimination. After grouping the cans according to like sounds, he puts the larger group (8) around the edge of the circular board, and the smaller group (4) in the center.

Auditory discrimination should be re-enforced and refined using musical instruments, tapping patterns, environmental sounds, etc.



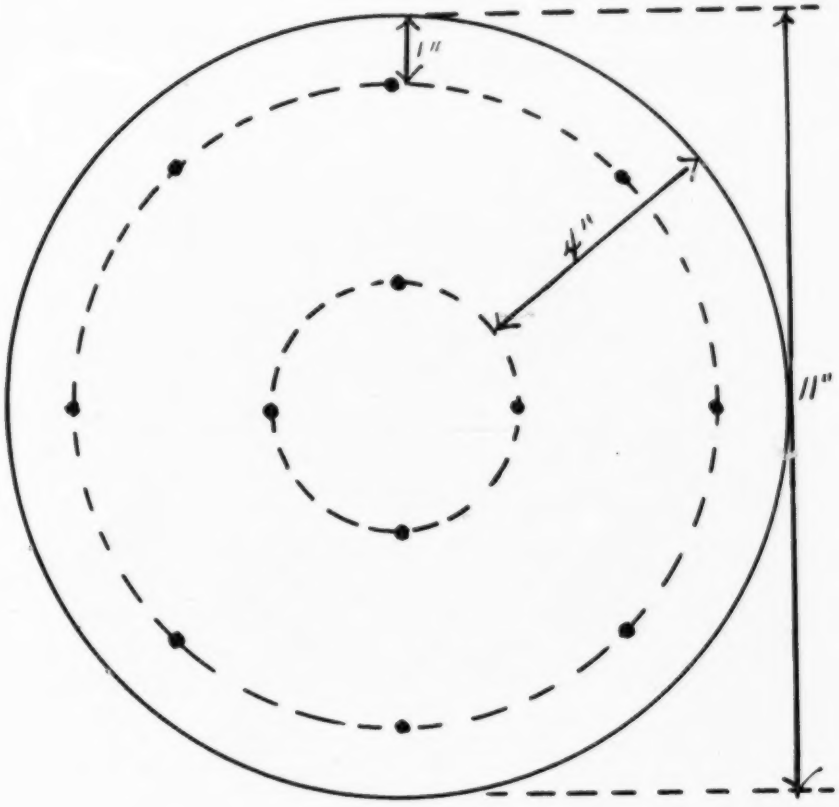
Sound Matching I

Step 1: Base: From ¾" plywood cut a circle 11" in diameter.
From ¼" plywood cut a circle 11" in diameter.

Step 2: In the ¾" circle cut in Step 1 make twelve holes 1⅜" in diameter, spacing as shown in the diagram.

Step 3: Glue the two sections of the base together. Paint a bright color.

Step 4: Using 35mm film cans as "pegs" fill eight with something that makes a distinctive sound when rattled. Fill the remaining four with something which makes a different sound when rattled. Glue the cans shut. Rice and marbles were used in the original.



SOUND MATCHING II

Description:

Four pairs of spice cans containing four objects or materials which give distinctive sounds when shaken are matched. A tray is provided.

Purpose:

The board gives an opportunity to pair identical sounds.

Behavioral Objective:

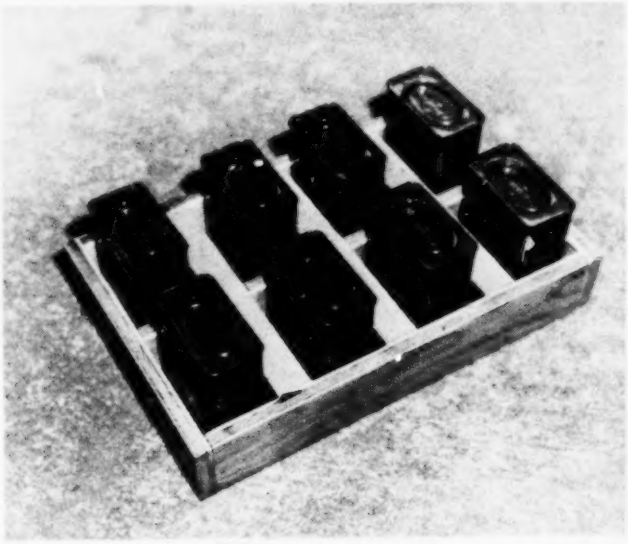
After shaking each can for sound, the child will be able to accurately match the four pairs which are alike.

Procedure and Use:

The sound cans may be used for the recognition of a **type** of sound as well as for sound matching. Placement of the cans in the tray gives an opportunity to re-enforce left and right, top and bottom, horizontal and vertical rows. Games incorporating sounds enhance auditory discrimination.

Other Materials:

Sound cylinders are available commercially.



Sound Matching II

Step 1: From ⅜" plywood cut two pieces 1¾" × 9" and two pieces 1¾" × 6¼". (Sides)

Step 2: From ⅜" plywood cut a piece 5½" × 9". (Bottom)

Step 3: Glue and nail the 1¾" × 9" strips to the 9" sides of the 5½" × 9" × ⅜" piece.

Step 4: Glue and nail the 1¾" × 6¼" end pieces to the 5½" × 9" × ⅜" bottom piece.

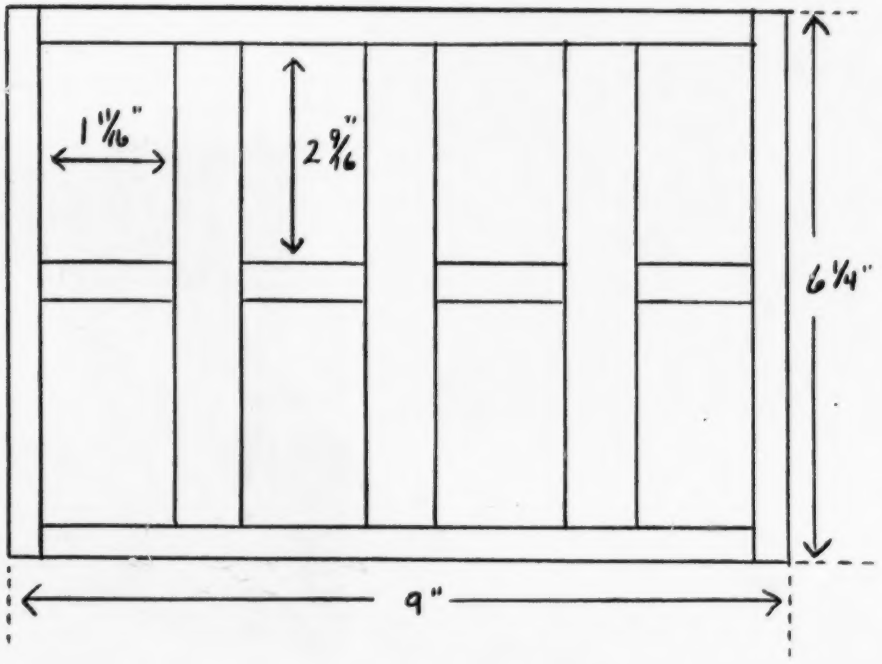
Step 5: From ¾" wood cut three pieces 5½" × 1⅜".

Step 6: Glue and nail the partitions cut in Step 5 into the box, forming four equal sections.

Step 7: From ⅜" plywood cut four pieces 1⅜" × 1-11/16".

Step 8: Glue the small partitions into place to form eight equal sections as shown in the diagram.

Step 9: Use spice cans 2¾" high, 2¼" wide, 1¼" deep with removable oval tops for the sound matching boxes. After putting in objects, glue the tops shut and paint. The following objects were used in the original: two cans with rice; two cans with salt; two cans with a single marble; two cans with 3 pennies.



NUMBER CONCEPTS IN PEGS AND CIRCLES

Description:

A series of ten separate boards correlates the same number of pegs and circular blocks. The pegs and blocks of each board are painted a different color. The first four may be taught as a unit by placing the boards in a tray.

Purpose:

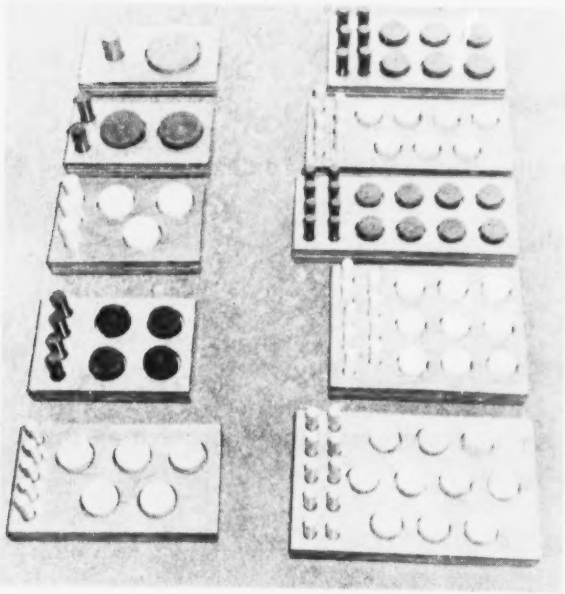
Each board teaches one to one correspondence of pegs and blocks and the series teaches progression of numbers.

Behavioral Objective:

The child will identify by number name and be able to count the number of pegs and blocks shown on each board, as he removes and replaces them.

Procedure and Use:

The child looks at the boards and tells what he sees. He counts the pegs and the blocks, and it is pointed out to him that there are the same number of blocks and pegs (one to one correspondence). As he removes and replaces the pegs and blocks he counts each. Re-enforcement comes through additional counting and number games.



Number Concept Board — One

Step 1: From ¾" plywood cut one circular block with a 3" diameter.

Step 2: From a ⅞" dowel cut one peg 2½" high.

Step 3: Base: From ⅜" plywood cut a piece 4" × 7½".
From ⅝" plywood cut a piece 4" × 7½".
From ¼" plywood cut a piece 4" × 7½".

Step 4: In the ⅜" × 4" × 7½" board make a circular cutout slightly larger than the block cut in Step 1 as shown in the diagram.

Step 5: Glue the ⅜" × 4" × 7½" board to the ⅝" × 4" × 7½" board.

Step 6: Drill one hole 15/16" in diameter through the two boards glued together in Step 5, observing the spacing shown in the diagram.

Step 7: Glue the ¼" × 4" × 7½" board on the bottom of the boards with the cutout and peg hole.

Step 8: Paint the peg and the block red.

Number Concept Board — Two

Step 1: From a piece of ¾" plywood cut two circular blocks with 2½" diameters.

Step 2: From a ¾" dowel cut two pegs 2½" high.

Step 3: Base: From ⅜" plywood cut a piece 4" × 7½".
From ⅝" plywood cut a piece 4" × 7½".
From ¼" plywood cut a piece 4" × 7½".

Step 4: In the ⅜" × 4" × 7½" board make two circular cutouts slightly larger than the blocks cut in Step 1 as shown in the diagram.

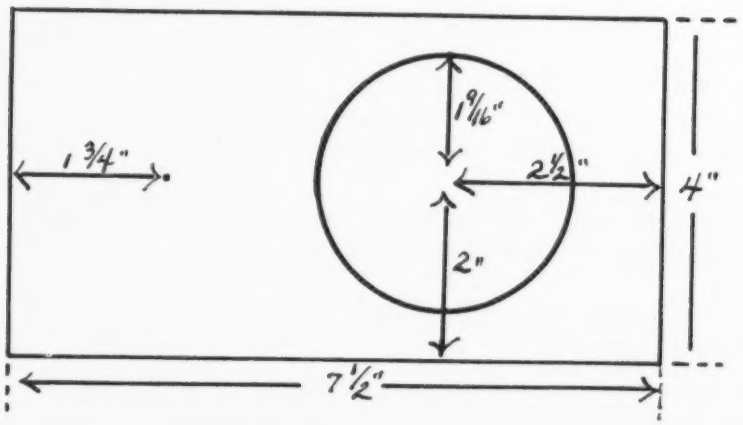
Step 5: Glue the ⅜" × 4" × 7½" board to the ⅝" × 4" × 7½" board.

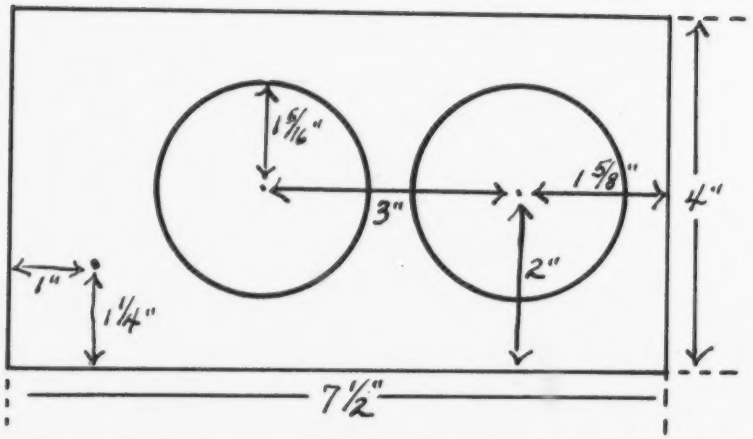
Step 6: Drill two holes 13/16" in diameter through the two boards glued together in Step 5, observing the spacing shown in the diagram.

Step 7: Glue the ¼" × 4" × 7½" board on the bottom of the boards with the cutouts and peg holes.

Step 8: Paint the pegs and the blocks green.

Number Concept Boards 1 & 2





Number Concept Board — Three

Step 1: From ¾" plywood cut three circular blocks with 2" diameters.

Step 2: From a ¾" dowel cut three pegs 2½" high.

Step 3: Base: From ⅜" plywood cut a piece 5" × 7½".
From ⅝" plywood cut a piece 5" × 7½".
From ¼" plywood cut a piece 5" × 7½".

Step 4: In the ⅜" × 5" × 7½" board make three circular cutouts slightly larger than the blocks cut in Step 1 as shown in the diagram.

Step 5: Glue the ⅜" × 5" × 7½" board to the ⅝" × 5" × 7½" board.

Step 6: Drill three holes 13/16" in diameter through the two boards glued together in Step 5, observing the spacing shown in the diagram.

Step 7: Glue the ½" × 5" × 7½" board on the bottom of the boards with the cutouts and peg holes.

Step 8: Paint the pegs and the blocks yellow.

Number Concept Board — Four

Step 1: From ¾" plywood cut four circular blocks with 1¾" diameters.

Step 2: From a ⅝" dowel cut four pegs 2½" high.

Step 3: Base: From ⅜" plywood cut a piece 5" × 7½".
From ⅝" plywood cut a piece 5" × 7½".
From ¼" plywood cut a piece 5" × 7½".

Step 4: In the ⅜" × 5" × 7½" board make four circular cutouts slightly larger than the blocks cut in Step 1 as shown in the diagram.

Step 5: Glue the ⅜" × 5" × 7½" board to the ⅝" × 5" × 7½" board.

Step 6: Drill four holes 11/16" in diameter through the two boards glued together in Step 5, observing the spacing shown in the diagram.

Step 7: Glue the ¼" × 5" × 7½" board on the bottom of the boards with the cutouts and peg holes.

Step 8: Paint the pegs and the blocks medium blue.

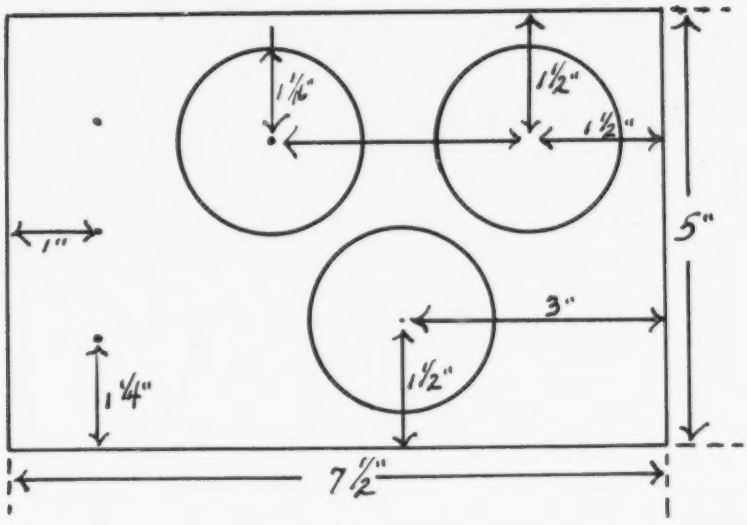
Tray for Boards 1 - 4

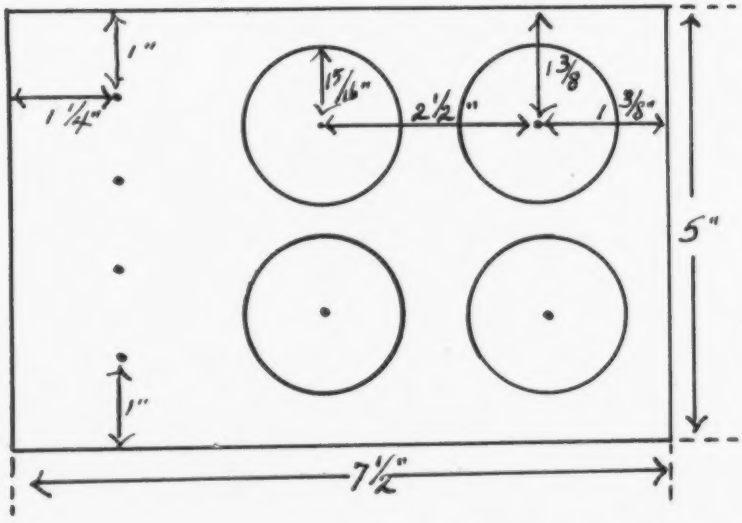
Step 1: From ½" plywood cut a piece 16¼" × 10¾".

Step 2: From ¾" quarter round cut two pieces 16¼" and two pieces 10¾".

Step 3: Frame the board with the quarter round, mitering the joints and nailing into place.

Number Concept Boards 3 & 4





Number Concept Board — Five

Step 1: From ¾" plywood cut five circular blocks with 1¾" diameters.

Step 2: From a ½" dowel cut five pegs 2½" high.

Step 3: Base: From ⅜" plywood cut a piece 5" × 9".
From ⅝" plywood cut a piece 5" × 9".
From ¼" plywood cut a piece 5" × 9".

Step 4: In the ⅜" × 5" × 9" board make five circular cutouts slightly larger than the blocks cut in Step 1 as shown in the diagram.

Step 5: Glue the ⅜" × 5" × 9" board to the ⅝" × 5" × 9" board.

Step 6: Drill five holes 9/16" in diameter through the two boards glued together in Step 5, observing the spacing shown in the diagram.

Step 7: Glue the ¼" × 5" × 9" board on the bottom of the boards with the cutouts and peg holes.

Step 8: Paint the pegs and the blocks orange.

Number Concept Board — Six

Step 1: From ¾" plywood cut six circular blocks with 1¾" diameters.

Step 2: From a ⅝" dowel cut six pegs 2½" high.

Step 3: Base: From ⅜" plywood cut a piece 5" × 9½".
From ⅝" plywood cut a piece 5" × 9½".
From ¼" plywood cut a piece 5" × 9½".

Step 4: In the ⅜" × 5" × 9½" board make six circular cutouts slightly larger than the blocks cut in Step 1 as shown in the diagram.

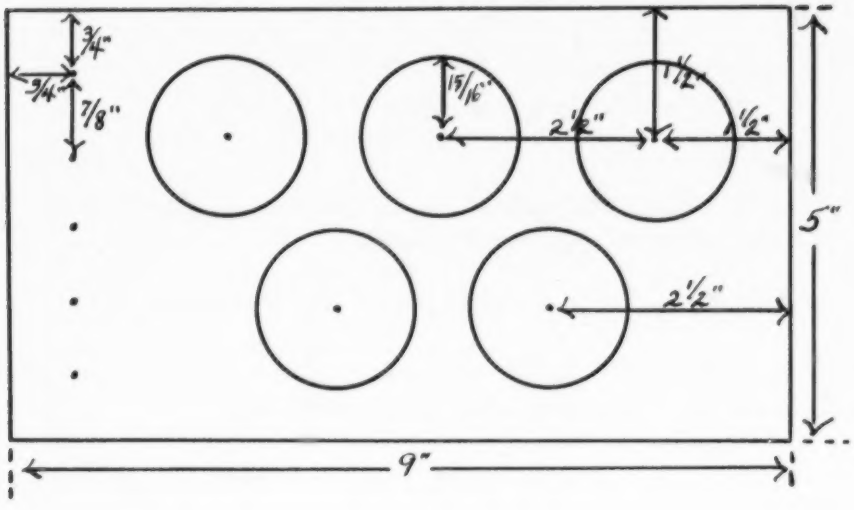
Step 5: Glue the ⅜" × 5" × 9½" board to the ⅝" × 5" × 9½" board.

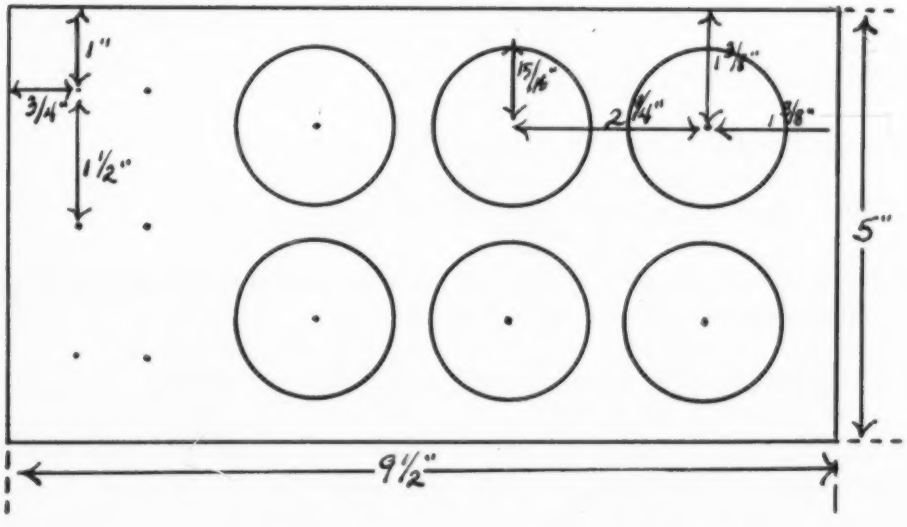
Step 6: Drill six holes 11/16" in diameter through the two boards glued together in Step 5, observing the spacing shown in the diagram.

Step 7: Glue the ¼" × 5" × 9½" board on the bottom of the boards with the cutouts and peg holes.

Step 8: Paint the pegs and the blocks brown.

Number Concept Boards 5 & 6





Number Concept Board — Seven

Step 1: From ¾" plywood cut seven circular blocks 1½" in diameter.

Step 2: From a ½" dowel cut seven pegs 2½" high.

Step 3: Base: From ⅜" plywood cut a piece 4½" × 10½".
From ⅝" plywood cut a piece 4½" × 10½".
From ¼" plywood cut a piece 4½" × 10½".

Step 4: In the ⅜" × 4½" × 10½" board make seven circular cutouts slightly larger than the blocks cut in Step 1 as shown in the diagram.

Step 5: Glue the ⅜" × 4½" × 10½" board to the ⅝" × 4½" × 10½" board.

Step 6: Drill seven holes 9/16" in diameter through the two boards glued together in Step 5, observing the spacing shown in the diagram.

Step 7: Glue the ¼" × 4½" × 10½" board on the bottom of the boards with the cutouts and peg holes.

Step 8: Paint the pegs and the blocks aqua.

Number Concept Board — Eight

Step 1: From ¾" plywood cut eight circular blocks 1½" in diameter.

Step 2: From a ½" dowel cut eight pegs 2½" high.

Step 3: Base: From ⅜" plywood cut a piece 4½" × 11".
From ⅝" plywood cut a piece 4½" × 11".
From ¼" plywood cut a piece 4½" × 11".

Step 4: In the ⅜" × 4½" × 11" board make eight circular cutouts slightly larger than the blocks cut in Step 1 as shown in the diagram.

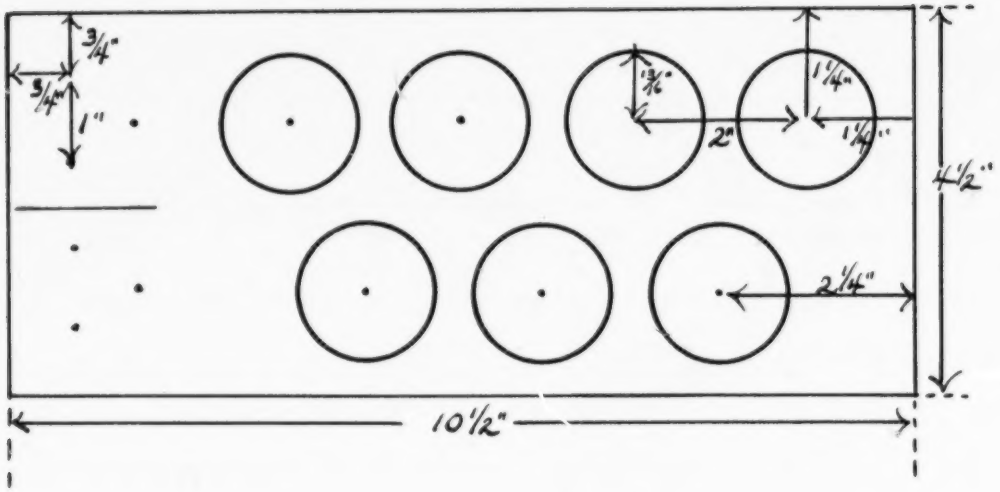
Step 5: Glue the ⅜" × 4½" × 11" board to the ⅝" × 4½" × 11" board.

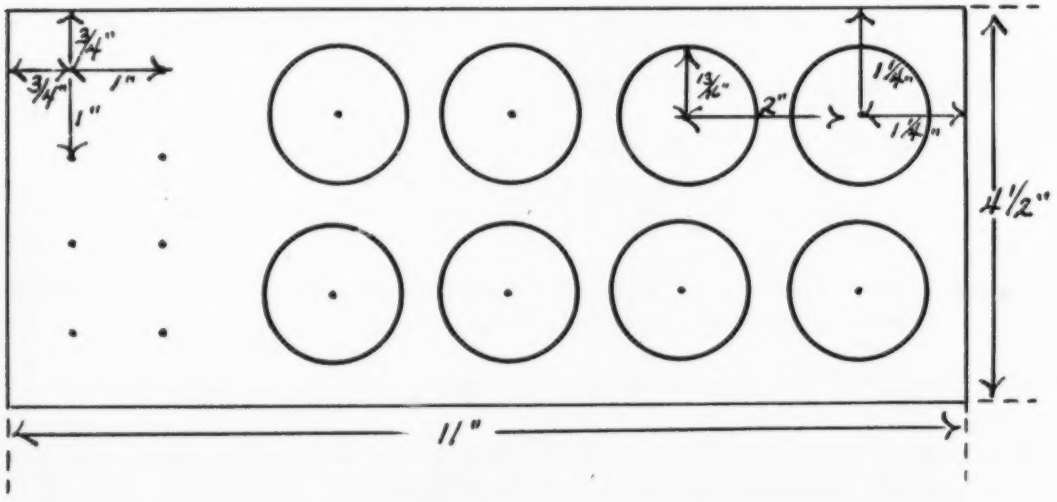
Step 6: Drill eight holes 9/16" in diameter through the two boards glued together in Step 5, observing the spacing shown in the diagram.

Step 7: Glue the ¼" × 4½" × 11" board on the bottom of the boards with the cutouts and peg holes.

Step 8: Paint the pegs and the blocks purple.

Number Concept Boards 7 & 8





Number Concept Board — Nine

Step 1: From ¾" plywood cut nine circular blocks 1½" in diameter.

Step 2: From a ½" dowel cut nine pegs 2½" high.

Step 3: From ⅜" plywood cut a piece 6½" × 9".
From ⅝" plywood cut a piece 6½" × 9".
From ¼" plywood cut a piece 6½" × 9".

Step 4: In the ⅜" × 6½" × 9" board make nine circular cutouts slightly larger than the blocks cut in Step 1 as shown in the diagram.

Step 5: Glue the ⅜" × 6½" × 9" board to the ⅝" × 6½" × 9" board.

Step 6: Drill nine holes 9/16" in diameter through the two boards glued together in Step 5, observing the spacing shown in the diagram.

Step 7: Glue the ¼" × 6½" × 9" board on the bottom of the boards with the cutouts and peg holes.

Step 8: Paint the pegs and the blocks pink.

Number Concept Board — Ten

Step 1: From ¾" plywood cut ten circular blocks 1½" in diameter.

Step 2: From a ½" dowel cut ten pegs 2½" high.

Step 3: Base: From ⅜" plywood cut a piece 6½" × 10½".
From ⅝" plywood cut a piece 6½" × 10½".
From ¼" plywood cut a piece 6½" × 10½".

Step 4: In the ⅜" × 6½" × 10½" board make ten circular cutouts slightly larger than the blocks cut in Step 1 as shown in the diagram.

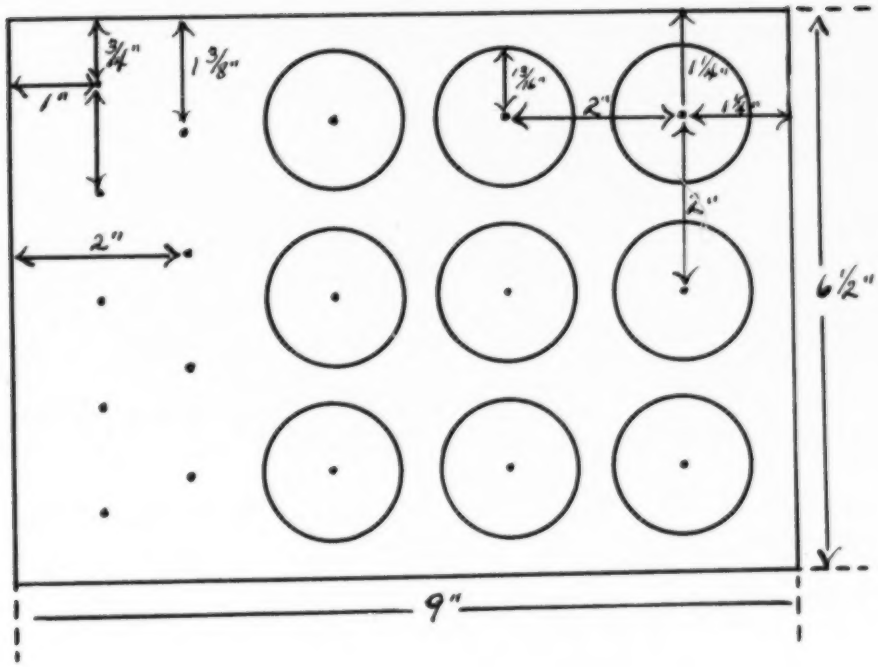
Step 5: Glue the ⅜" × 6½" × 10½" board to the ⅝" × 6½" × 10½" board.

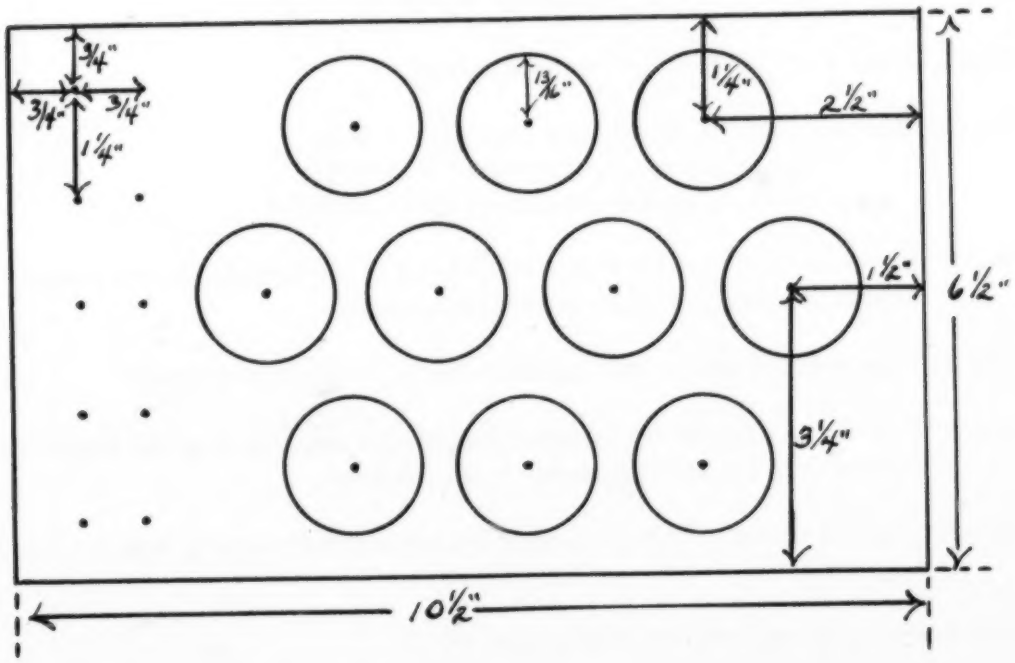
Step 6: Drill ten holes 9/16" in diameter through the two boards glued together in Step 5, observing the spacing shown in the diagram.

Step 7: Glue the ¼" × 6½" × 10½" board on the bottom of the boards with the cutouts and peg holes.

Step 8: Paint the pegs and the blocks light blue.

Number Concept Boards 9 & 10





OBJECT CONCEPT PLAQUES

Description:

Five wooden plaques have familiar objects in sets of 1, 2, 3, 4, and 5 mounted on them.

Purpose:

The plaques may be used in identifying, counting, and recognizing categories of objects.

Behavioral Objective:

The child will be able to state the name and use of each object and count the number of each on the boards.

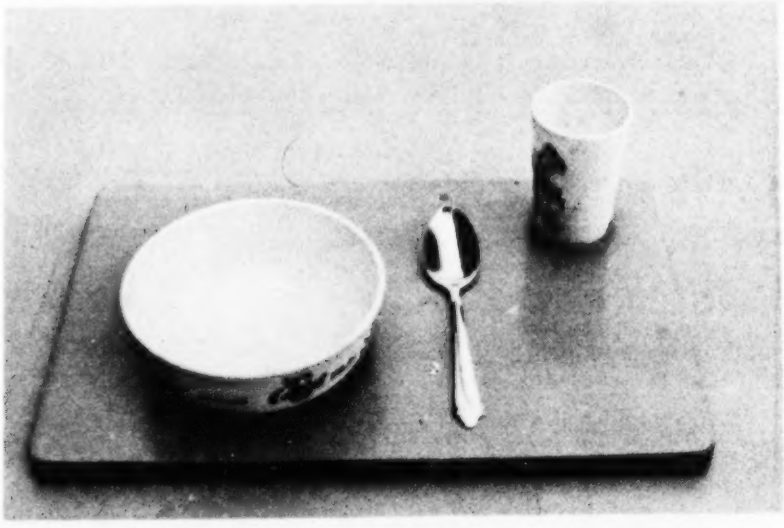
Procedure and Use:

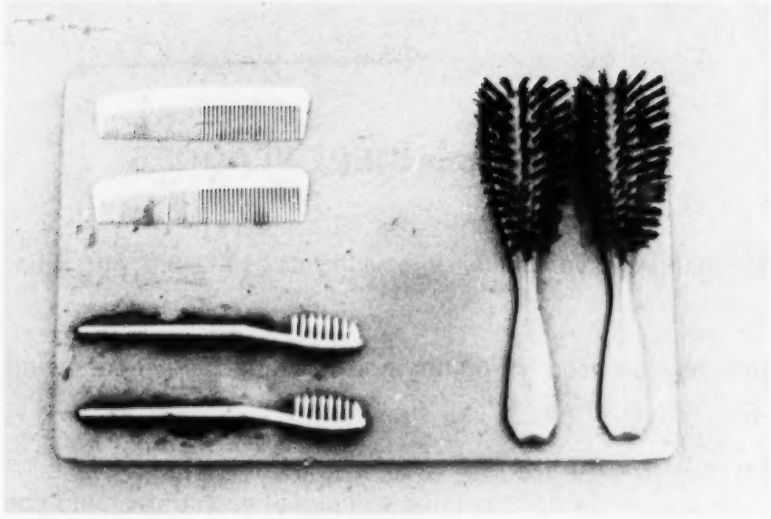
The children identify the objects, discuss what each is used for, and tell how many there are of each. If possible show identical objects along with the boards so that the children can examine them in a different way.

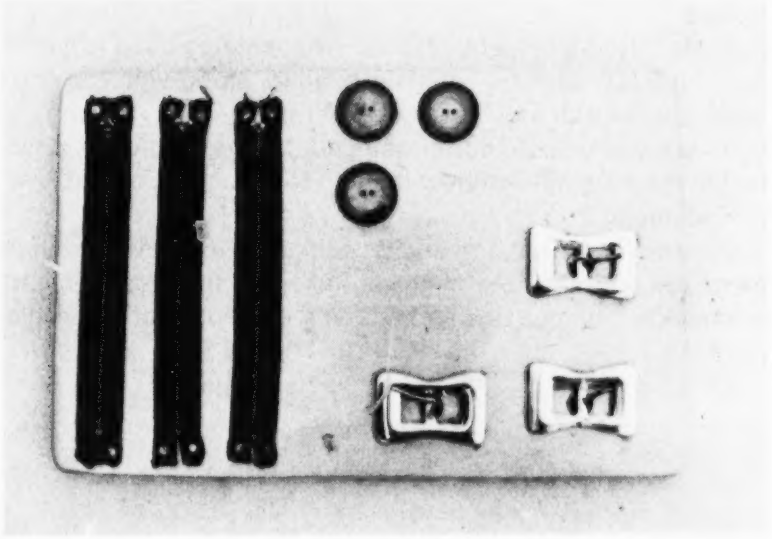
The plaques may also be used for classification. The beginner is told that these go together. Later the discussion is on **how** they go together, when and how they are used, and who would use them.

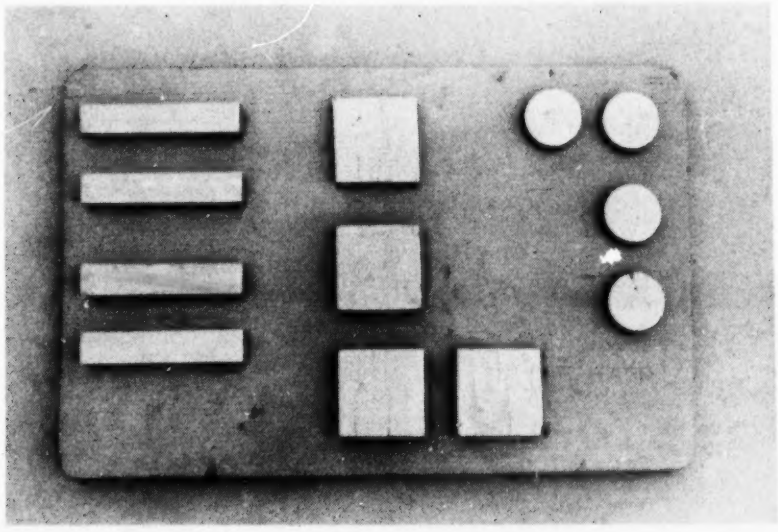
The concepts of left and right, top and bottom can be re-enforced here also.

As an enrichment feature, note might be taken of the arrangement of the objects with reference to simple number sets and addition and subtraction problems.









Object Concept Plaques

Step 1: From ½" plywood cut five pieces 9" × 14". Round the corners and paint.

Step 2: Mount objects of the plaques as follows:
One: bowl, glass, spoon
Two: 2 combs, 2 toothbrushes, 2 hair brushes
Three: 3 zippers, 3 buttons, 3 buckles
Four: 4 round blocks 1¼" in diameter, 4 rectangular blocks ¾" × 3½", 4 square blocks 1⅞" × 1⅞".
Five: 5 spools of thread, 5 tapestry needles, 5 thimbles.

Case

Step 1: From ⅜" plywood cut five pieces 9" × 15" for the shelves and bottom.

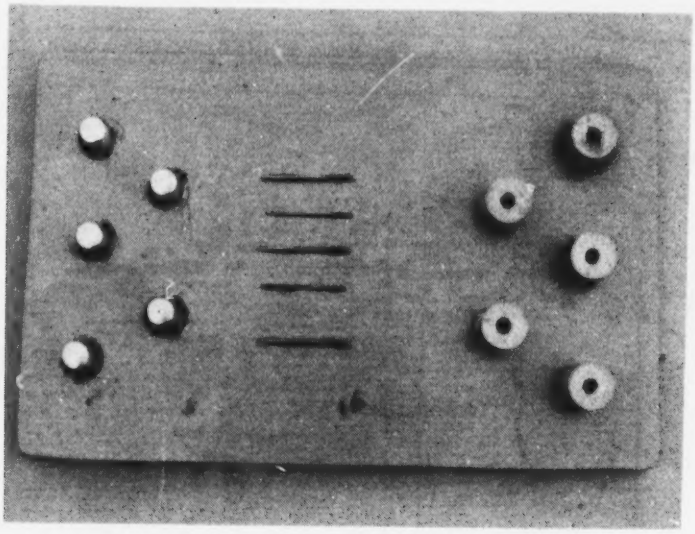
Step 2: From ⅝" plywood cut one piece 9" × 15" for the top.

Step 3: From ⅜" plywood cut two pieces 9⅜" × 15" for the sides.

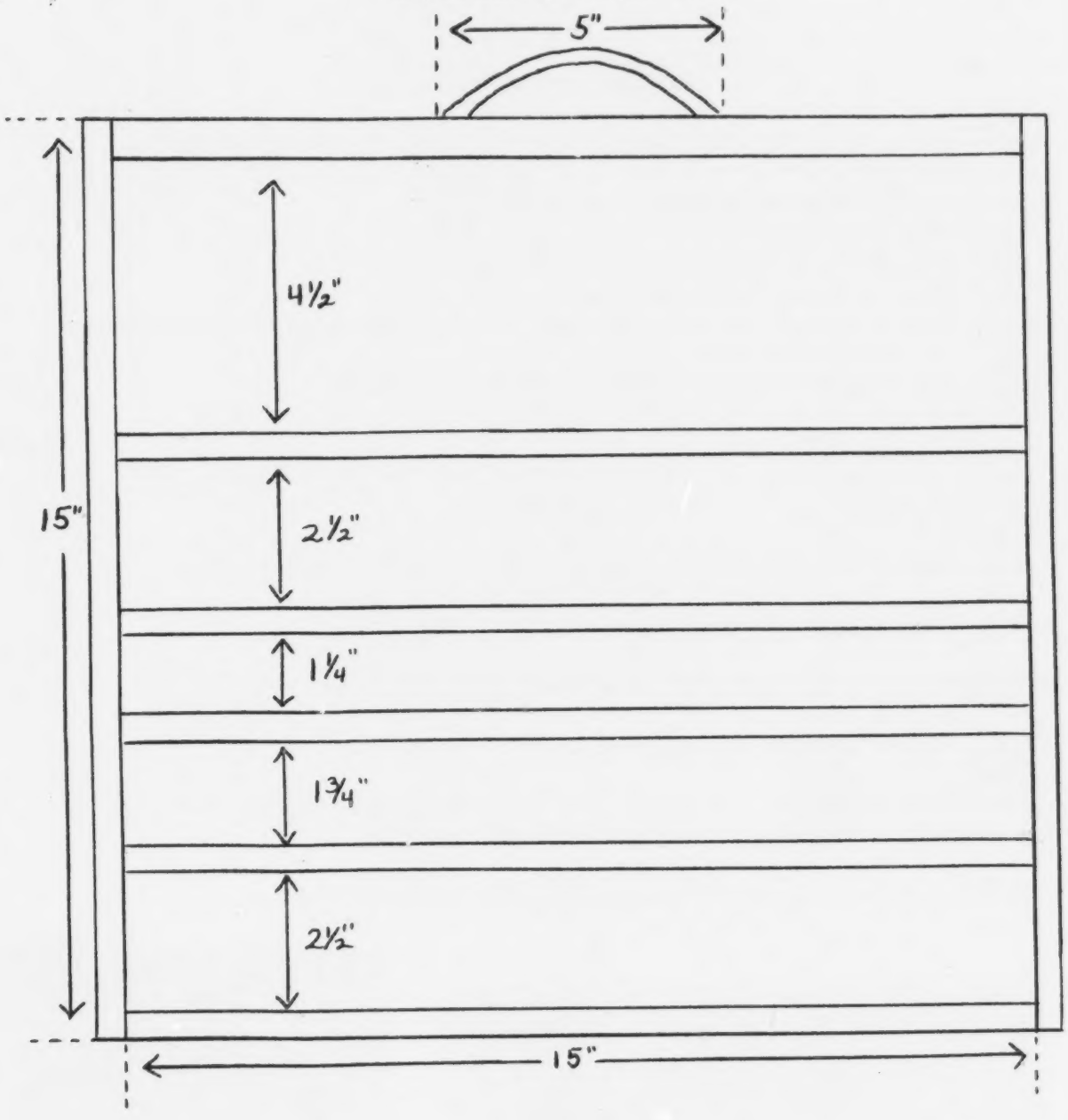
Step 4: From ⅜" plywood cut one piece 15" × 15" for the back.

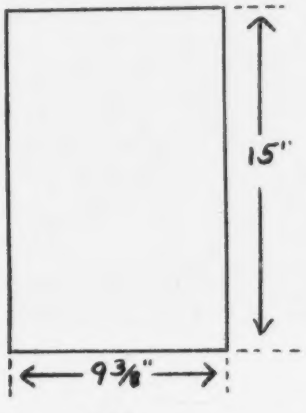
Step 5: Assemble as shown in the diagram, nailing the shelves, top, and bottom to the sides at the intervals shown before nailing on the back.

Step 6: Fasten a 5" drawer pull handle in the center of the top as shown.



Object Concept Plaques Case





NUMBER SEQUENCING PUZZLE

Description:

Five puzzle blocks on which one to five metal chair glides have been hammered are fitted together in sequence in a tray.

Purpose:

The correct sequence of the blocks is assured by correct fitting together of the five puzzle blocks.

Behavioral Objective:

The child will be able to count the dots on each puzzle piece and fit the pieces in sequence accurately.

Procedure and Use:

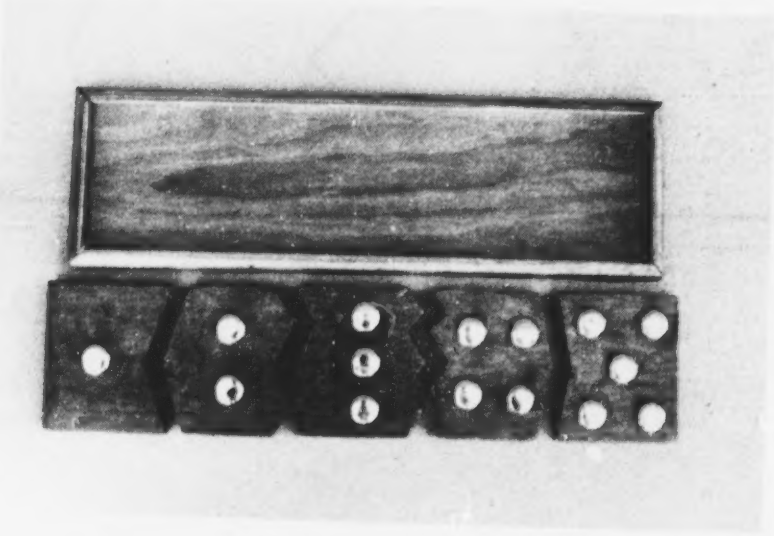
This is used after the child has been exposed to the number concept of one through five. It re-enforces the concept of what comes **after** each number.

The puzzle all together in the tray is presented to the child. He looks at each piece from left to right, examining the raised chair glide dots and counting the number on each block. Then he is ready to remove the pieces and see how they fit together in progression one after the other, from one to five.

Constant re-enforcement is needed.

Variation:

Smaller puzzle blocks with upholstery tacks instead of chair glides can be made to extend number sequencing through ten.



Number Sequencing Puzzle

Step 1: From ¾" plywood cut a piece 4½" × 17¼".

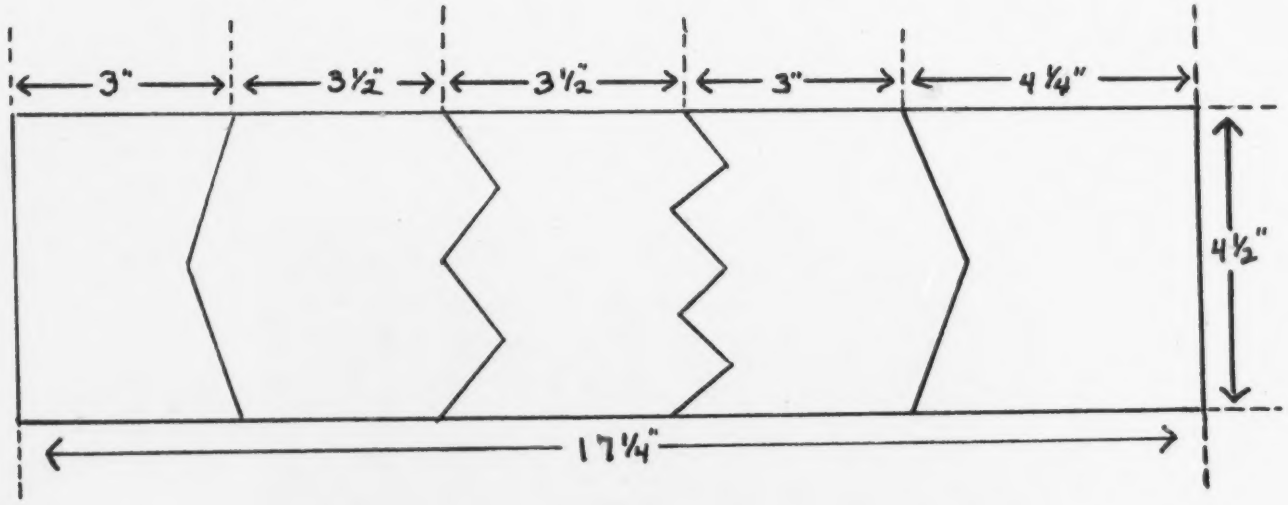
Step 2: Cut the strip into five sections jig-saw fashion as shown in the diagram.

Step 3: Hammer fifteen ⅞" metal chair glides into place as shown.

Step 4: From ¼" plywood cut a piece 18½" × 5½" for the base of the tray.

Step 5: From ½" quarter round cut two pieces 18½" long and two pieces 5½" long.

Step 6: Frame the tray cut in Step 6 with the quarter round, mitering the joints and nailing into place.



NUMBER PROGRESSION STEPS

Description:

Rows of holes arranged progressively from one to ten are drilled in a base which is cut stairstep fashion. Dowel pegs are used.

Purpose:

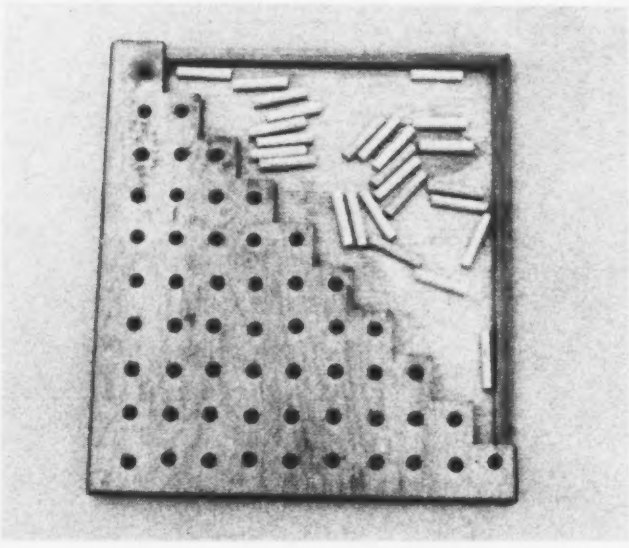
The pegboard gives practice in coordination of thinking and manipulation along with understanding of the sequential nature of numeration.

Behavioral Objective:

The child will be able to remove all pegs and replace each row as requested (in sequential order) counting the pegs as they are inserted.

Procedure and Use:

This pegboard is used to teach the progression of numbers from one to ten by showing how you build on the steps. Starting with one or two rows in which the child may place pegs from left to right in sequential order, additional rows are added as his understanding increases. Rows not being used may be covered until the child is ready for them. Constant re-enforcement is needed.



Number Progression Steps

Step 1: From ⅜" dowels cut 55 pegs 1½" high.

Step 2: Base: From ¾" plywood cut a piece 16" × 14⅝".
From ¼" plywood cut a piece 16" × 14⅝".

Step 3: In the ¾" × 16" × 14⅝" board drill 55 holes with a diameter of 7/16" as shown in Figure 1.

Step 4: Cut the board with the peg holes stair-step fashion as shown in Figure 2.

Step 5: Round the corners of each step.

Step 6: Glue the two sections of the base together.

Step 7: Cut two pieces of ¾" quarter round to frame the triangular extension formed. Miter the joints and fasten with glue and nails.

Number Progression Steps

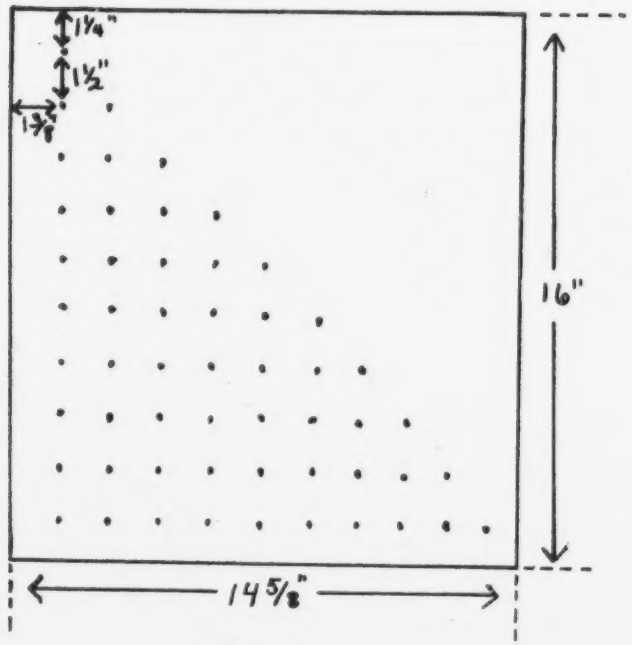


Fig. 1

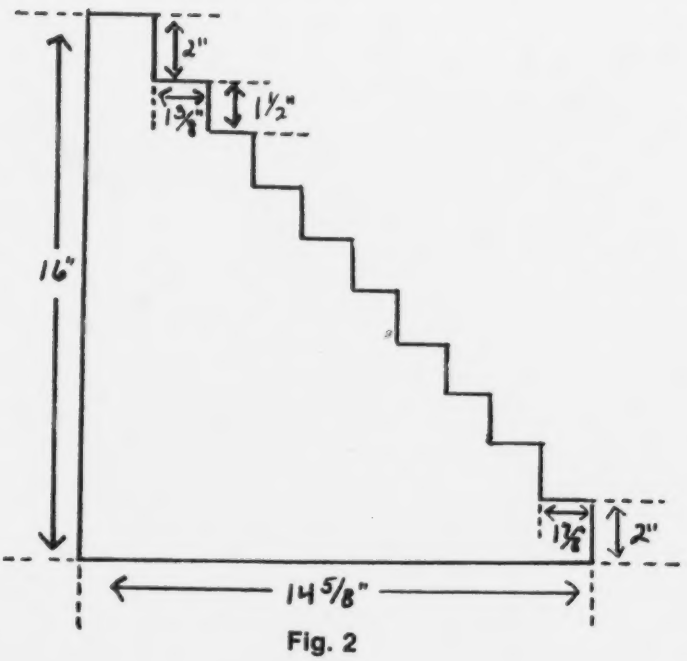


Fig. 2